

REVIEW OF MEDICAL AND VETERINARY MYCOLOGY

VOL. II

1957

PART 9

1932. LANGER (H.). **Dermatomykose durch *Mikrosporon gypseum* nach ungewöhnlichem Infektionsweg.** [Dermatomycosis caused by *Microsporum gypseum* with an unusual mode of infection.]—*Derm. Wschr.* 132, 47, pp. 1254–1260, 5 figs., 1955.

Microsporum gypseum, a rare dermatophyte in Germany [2, Nos. 1399, 1665], was isolated on beer wort agar with an admixture of 1 per mille potassium-tellurite at the Charité University Skin Clinic, Berlin, from a superficial lesion on the left under arm of a 21-year-old female biological student. There was no recent history of animal contacts, and the infection is presumed to have been contracted from soil in the course of handling plants in the Botanical Garden.

1933. CROSSLAND (P. M.). **Therapy of tinea capitis—the value of X-ray epilation**—*Calif. Med.*, 84, 5, pp. 351–353, 1 fig., 1956.

This is a plea from the Stanford University School of Medicine, San Francisco, for the use of X-ray epilation in the therapy of tinea capitis caused by *Microsporum audouinii*. The procedure, which should be carried out by the Kienböck-Adamson technique [2, No. 1099], is indicated in cases (1) showing no response to topical treatment after two months; (2) where infection is spreading, either by enlargement of a single lesion or the formation of new ones; and (3) for the control of communal epidemics or to prevent dissemination within a family.

1934. TOBIAS (N.). **Ringworm of the scalp. A clinical survey.**—*Missouri Med.*, 53, 1, pp. 21–24, 7 figs., 1956.

Of the 80 cases of tinea tonsurans herein reported from the author's private practice at St. Louis, Missouri, 62 were in boys. *Microsporum audouinii* was the causal organism in 61, *M. canis* in 16, *Trichophyton gypseum* [*T. mentagrophytes*] in two, and *T. violaceum* in one. Direct contacts with other children were the source of infection in 28 patients and 15 were probably contaminated by diseased kittens. *M. canis* infections usually clear up within three weeks as a result of local treatment with tincture of iodine or 5 per cent. ammoniated mercury or sulphur ointment, but X-ray epilation by the Adamson-Kienböck method [see preceding entry] is mandatory for the elimination of *M. audouinii*.

1935. DURIE (E. BEATRIX). **Mycotic infections of the scalp; mycology.**—*Med. J. Aust.*, 43 (i), 16, pp. 648–651, 1956.

Of 122 cases of tinea of the scalp seen at the Royal North Shore Hospital, Sydney, New South Wales, between June, 1949, and July, 1955, 90 (73·8 per cent.) were caused by *Microsporum canis*, seven (5·7) by *M. audouinii*, 11 (9) by *M. gypseum*, eight (6·7) by *Trichophyton crateriforme* [*T. tonsurans*], one each (0·8) by *T. mentagrophytes*, *T. rubrum*, *T. purpureum* [*T. rubrum*], and *T. violaceum*, and two (1·6) by *T. sulphureum*.

1936. FLORES DEL FIERRO (C. H.), GUTIERREZ (J. E.), & BIEFANG (B. F.). **Paralelismo etiológico entre la tiña del Perro y Gato y la del Niño en la ciudad de Santiago.** [The same causative agent for tinea of the Dog and Cat and Children in Santiago city.]—*Rev. vet. milit., B. Aires*, 2, 7, p. 213, 1954.

Studies of tinea in 52 dogs, 17 cats, and 50 children in Santiago, Chile, revealed *Microsporum canis* to be the cause in all cases. Of 69 animal hair and claw samples eleven still yielded the pathogen in culture after two months while of 15 human samples one was still viable. One dog hair sample still yielded the fungus after 22 months. *M. canis* was reisolated from all inoculations.

1937. GEISER (J. D.). **Action antifongique in vitro de quelques antihistaminiques de synthèse et autres substances.** [Anti-fungal action *in vitro* of some synthetic anti-histamines and other substances.]—*Dermatologica, Basel*, 110, 3-5, pp. 343-347, 1955. [German and English summaries.]

Gentian violet was the most potent among eight anti-histamines and five other substances tested against 20 dermatophytes in liquid culture (peptone-glucose-distilled water) at the Dermatological Clinic of the University, Lausanne, Switzerland. In a special series of tests with *Microsporum gypseum*, one hour's contact with phenergan (dimethyl-amino-2 propyl-1-N-dibenzo-parathiazine) at a concentration of 1 in 1,000 sufficed to prevent further growth in subcultures on Sabouraud's media.

1938. CALNAN (C. D.). **Tinea pedis.**—*Med. World, Lond.*, 84, 2, pp. 117-119, 1956.

General information is presented on the accessory factors involved in the development of tinea pedis [of unspecified origin], and on the etiology, incidence, and treatment of the complaint, preferably with Whitfield's ointment or lotion (containing benzoic and salicylic acids), which are considered to be still unsurpassed after 50 years.

1939. ZWEILING (G.). **Bekämpfung der Pilzerkrankungen in gewerblichen Betrieben.** [Control of fungal diseases in industrial concerns.]—*Zbl. Arbeitsmed.*, 5, 4, pp. 126-127, 3 figs., 1955.

Of 222 workers examined at a factory on the Lower Rhine, Germany, 132 (59.4 per cent.) were found to be suffering (12 severely) from [unspecified] fungal infections of the feet. Hygienic counter-measures were promptly undertaken, including spraying of the washrooms, shower-bath installations, and wooden planks with myxal [1, No. 2331] at a concentration of 1 in 1,000, using a specially designed apparatus attached to the water-supply. By the end of three months the number of persons infected was only 15 (6.76 per cent.), none of them severely.

1940. MACKENNA (R. M. B.) & HORNER (SIBYL). **Occupational skin diseases.** *Ex Industrial Medicine and Hygiene*, edited by R. E. MEREWETHER, Volume 2, Chapter I, pp. 1-101, 1 col. pl., 30 figs., London, Butterworths Medical Publications, 1954.

Information is briefly presented on the following occupational mycoses occurring in Great Britain: actinomycosis (*Actinomyces israeli*); botryomycosis [bacterial infections (associated with foreign bodies), simulating actinomycosis]; cutaneous infections (especially paronychia) caused by *Candida albicans*; tinea, including tinea barbae [*Trichophyton mentagrophytes* or *T. verrucosum*], and favus [*T. schoenleini*]; epidermophytosis [*Epidermophyton* sp.]; cutaneous blastomycosis [*Blastomyces dermatitidis*]; coccidioidomycosis (*Coccidioides immitis*); and sporotrichosis (*Sporotrichum schenckii*). The chapter concludes

with sections on prevention, recurrence, and prognosis and on differential diagnosis, followed by a list of references.

1941. MEYER (ESTHER). **The preservation of dermatophytes at sub-freezing temperatures.**—*Mycologia*, 47, 5, pp. 664–668, 1955.

At the College of Medicine, University of Illinois, Chicago, viable cultures of dermatophytes free from pleomorphic changes were maintained for two years by suspending the fungi in human blood plasma or litmus milk and storing at -22° or -52° C.

1942. DOWNING (J. G.). **Dermatologic therapy.**—*New Engl. J. Med.*, 253, 5, pp. 184–190; 6 pp., 234–241, 1955.

This is a critical survey of up-to-date methods for the therapy of skin complaints, including mycoses, based on personal experience at the Boston and Tufts University Schools of Medicine, Massachusetts, and 72 contributions to the relevant literature.

1943. KUROGOCHI (Y.), KITAMURA (T.), MINAMI (M.), & UEDA (Y.). **Chemotherapy of dermatomycosis. II. In vitro test of some antifungal agents on Trichophyton.**—*J. Nara med. Ass.*, 6, pp. 101–103, 1955. [Abs. in *Chem. Abstr.*, 50, 15, col. 10857, 1956.]

The growth of strains I and II of *Microsporum japonicum*, *Sabouraudites ruber* [*Trichophyton rubrum*], *S. interdigitalis* [*T. interdigitale*], and *S. asteroides* [*T. mentagrophytes*] was inhibited by alkyl dimethylbenzylammonium chloride naphthoquinone, 2-methyl-naphthoquinone, 2-methylmercapto-naphthoquinone, 2-acetamido-naphthoquinone, 2-lauryl-mercapto-naphthoquinone, 2-methyl-mercapto-3-acetamido-naphthoquinone, methyl undecylenate, methyl cinnamate, asterol, and 1-hydroxy-3-methyl-4-isopropylbenzene at concentrations below 1 mg. per ml. No such effect was exerted in comparable tests with nitrogen mustard, methyl benzoate, benzyl cinnamate, or non-ionic surface-active agents.

1944. COLLIER (H. O. J.), POTTER (M. D.), & TAYLOR (E. P.). **Antifungal activities of bisoquinolinium and bisquinolinium salts.**—*Brit. J. Pharm. Chemother.*, 10, 3, pp. 343–348, 1 fig., 1955.

A study of the anti-fungal properties of members of the bisoquinolinium series and some corresponding bis-quinolinium salts is described. Polymethylene bisoquinolinium salts with 10 to 20 methylene groups and the corresponding quinolinium salts were tested for activity against *Trichophyton mentagrophytes*. In both series, activity increased in proportion to the chain-length up to the tetradecamethylene member, marked decline in activity occurring at the eicosane compounds. The tetradeca- and hexadecamethylene members of both series inhibited the growth of 11 strains of *Candida albicans*, *Microsporum audouinii*, *M. canis*, *T. mentagrophytes*, *T. rubrum*, and *T. verrucosum* in Sabouraud's broth at concentrations between 0.3 and 10 μ g. per ml. The tetradeca- and hexadecamethylene bisoquinolinium salts were antagonized by hair and serum, while the latter compound was potently antagonized by bovine bile. Exposure for 24 hours at 20° C. to hexadecamethylene bis-(isoquinolinium methosulphate) did not destroy spores of *T. mentagrophytes* suspended in saline, but viable spores could not be detected after incubation for seven days at 27° with a concentration of 1.25 μ g. per ml. of this compound in Sabouraud's broth. Toxicity studies on mice and rabbits were also carried out, and it is concluded that clinical trials of the tetradeca- and hexadecamethylene bisoquinolinium compounds in fungal infections of the skin would appear to be justified.

1945. LURIE (H. I.) & BOROK (R.). **Trichophyton mentagrophytes isolated from the soil of caves.**—*Mycologia*, 47, 4, pp. 506–510, 4 figs., 1955.

During an investigation of 'cave disease' in a group of speleologists, most of whom were positive to the histoplasmin skin test, samples of soil from caves [2, No. 1828] frequented by the persons affected were examined at the South African Institute for Medical Research, Johannesburg, and on one filter membrane a macroconidium indistinguishable from those of *Microsporum gypsum* was seen. The fungus was not recovered in culture. From the soil of two caves in the Transvaal, both uninhabited and infested with bats, *Trichophyton mentagrophytes* (*asteroides* type) was isolated, apparently for the first time from soil.

1946. MENGES (R. W.) & GEORG (LUCILLE K.). **An epizootic of ringworm among Guinea Pigs caused by Trichophyton mentagrophytes.**—*J. Amer. vet. med. Ass.*, 128, 8, pp. 395–398, 5 figs., 1956.

An outbreak of tinea caused by *Trichophyton mentagrophytes* occurred among several thousand guinea-pigs in a laboratory in Georgia during the spring of 1954. The fungus developed in culture on cycloheximide [actidione] medium [2, No. 409] from hair specimens of 130 out of 151 animals. The scaly, circular lesions developed mainly on the head but also involved the back; some of them healed spontaneously. The infection was accompanied by erythema and loss of hair. The pathogen was introduced with a few animals and its spread was probably assisted by constant handling.

1947. HAYES (F. A.). **Treatment of ringworm in Chinchillas.**—*J. Amer. vet. med. Ass.*, 128, 4, pp. 193–195, 4 figs., 1956.

From the School of Veterinary Medicine, Athens, Georgia, the author describes the symptoms of tinea (*Trichophyton mentagrophytes*) in the chinchilla and its successful treatment with vioform (iodochlorohydroxyquinoline).

1948. ADAMS (L.), SALVIN (S. B.) & HADLOW (W. J.). **Ringworm in a population of Snowshoe Hares.**—*J. Mammol.*, 37, 1, pp. 94–99, 1956.

In a study of an isolated population of snowshoe hares (*Lepus americana*) on an island in Flathead Lake, Montana, United States, about 35 per cent. of the animals were found to be infected with *Trichophyton mentagrophytes*, symptoms including matting of the hair, mild epilation, varying degrees of hyperkeratosis, and minimal inflammatory changes in the dermis. The incidence of the disease decreased slightly from October to January, and was slightly, though not significantly, higher in young animals.

1949. CRUICKSHANK (C. N. D.) & TROTTER (M. D.). **Separation of epidermis from dermis by filtrates of Trichophyton mentagrophytes.**—*Nature, Lond.*, 177, 4519, pp. 1085–1086, 1 graph, 1956.

A study at the Medical School, University of Birmingham, of the effects of filtrates of *Trichophyton mentagrophytes* upon guinea-pig ear skin cultured on a simple fluid medium demonstrated that the fungus contained one or more proteolytic enzymes which separated the epidermis from the dermis and may be responsible for the itching associated with epidermophytosis.

1950. HUPPERT (M.). **Immunological studies of the dermatophytes.**—*Diss. Abstr.*, 15, 8, p. 1294, 1955.

The existence of extensive cross-reactions between different species of dermatophytes was confirmed at Columbia University by means of the collodion

particle aggregation technique, which also revealed a strain type of specificity in the *gypseum* group of dermatophytes. The method of Heidelberger *et al.*, with only slight modifications, permitted two distinct purified carbohydrates to be obtained from 15 strains of *Trichophyton mentagrophytes*. One, designated C-1, is precipitated by 1 to 1½ volumes of alcohol, contains approximately 19 per cent. reducing sugar but no nitrogen, and is apparently present in all members of the group. The other, C-2, is precipitated by three to five volumes of alcohol. On the basis of absorption tests with the C-2, fractions, three distinct immunological groups were defined among these strains of *T. mentagrophytes*.

1951. CREMER (G.). **The influence of adrenocortical hormones on dermatomycosis, especially in the Cushing syndrome.**—*Dermatologica, Basel*, 111, 5, pp. 285–293, 6 figs., 1955.

Four cases of Cushing's disease, two caused by prolonged administration of adrenocortical hormones and all accompanied by dermatomycosis, are reported from the Department of Dermatology, University of Amsterdam, Holland. The fungi concerned were *Trichophyton mentagrophytes* in two cases, *T. tonsurans*, and (in the same patient) *Candida albicans* and *T. rubrum*.

From the severity of the symptoms, failure of antimycotic therapy, and other pertinent observations it appears that resistance to fungal skin infections is materially weakened in Cushing's disease.

1952. ITO (K.) & KUHLMANN (HERMINE). **Infektionen mit Epidermophyton Kaufmann-Wolf und Candida albicans bei mit Chlordinitrobenzol und Benzol sensibilisierten Meerschweinchen. (Vorläufige Mitteilung.)** [Inoculations with *Epidermophyton Kaufmann-Wolf* and *Candida albicans* on Guinea-Pigs sensitized with chlorodinitrobenzol and benzol. (Preliminary note.)]. *Z. Haut- u. Geschlechtskr.*, 20, 10, pp. 291–296, 2 figs., 1956.

At the Dermatological Clinic of the Municipal Hospitals, Essen, Germany, the sensitization of guinea-pigs with 5 per cent. chlorodinitrobenzol (1:2:4) facilitated subsequent intracutaneous inoculation with *Epidermophyton Kaufmann-Wolf* [*Trichophyton interdigitale*] and *Candida albicans*. Recovery from dermatitis induced by the chlorodinitrobenzol treatment was retarded by the fungal infections. Viable spores were found in the cutis even after the lesions were macroscopically healed.

1953. COHEN (S. G.). **Trichophytin sensitivity of the immediate wheal type. Report of a case with unusual manifestations and response to hydrocortisone.**—*J. Allergy*, 27, 4, pp. 332–337, 1956.

From the Mercy Hospital, Wilkes-Barre, Pennsylvania, the author reports the case of a 59-year-old housewife with a ten-year history of recurrent episodes of fungal infection of the crural region, accompanied by secondary erythematous-oedematous lesions of the buttocks, thighs, forearms, and flexor surfaces of the elbows and knees. *Trichophyton gypseum* [*T. mentagrophytes*] was isolated on Sabouraud's dextrose agar from the crural lesions, and intracutaneous testing with trichophytin extracts induced an immediate positive wheal-flare response and a negative 48-hour delayed-type reaction. The available evidence suggests that this represents an unusual type of dermatophytid characterized by fixed tissue sensitization. The secondary symptoms yielded to a course of oral administration of hydrocortisone, starting with divided doses totalling 80 mg. on the first day and diminishing by 10 mg. daily until a dose of 40 mg. was reached on the fifth. The crural dermatitis was unaffected by this mode of therapy but it gradually subsided and cleared after

a fortnight's treatment with wet compresses of potassium permanganate solution (1 in 12,000) and topical applications of 1 per cent. gentian violet.

1954. GEORG (LUCILLE K.). **The role of animals as vectors of human fungus diseases.**—*Trans. N.Y. Acad. Sci.*, Ser. II, 18, 7, pp. 639–646, 1956.

On the basis of personal experience and a study of the relevant literature the author finds no conclusive evidence that systemic fungal infections are transmissible from animals to man. The cutaneous mycoses of animals, however, are readily communicable to humans and constitute an important public-health problem. In this connexion information is presented on five agents of animal tinea, viz., *Microsporum canis*, *M. gypseum*, *Trichophyton mentagrophytes* var. *granular* (syn. *T. gypseum*, *T. asteroides* [both = *T. mentagrophytes*], and *T. granulosum*), *T. equinum*, and *T. gallinae*. A recent survey in a rural area of Michigan showed that 32 out of 63 cases of suppurative tinea were caused by *T.m.* var. *granular* and the remainder by *T. verrucosum*.

1955. BJØRNSTAD (R. T.). **Trichofyti hos Orienteringsløpere.** [Trichophytosis in cross-country Runners.]—*Tidsskr. norske Lægeforen.*, 76, 8, pp. 253–255, 2 figs., 1956. [English summary.]

Six cases of deep trichophytosis of the thigh and knee-joint region, attributed to 'bovine *Trichophyton*' [(?) *verrucosum*], in males aged 18 to 32 years are reported from the State Hospital, Oslo, Norway. Infection of this unusual site was acquired running through bushes and undergrowth during cross-country races.

1956. WALKER (JACQUELINE). **Possible infection of a Man by indirect transmission of *Trichophyton discoides*.**—*Brit. med. J.*, No. 4953, pp. 1430–1431, 1955.

Specimens of scrapings of walls of cowsheds, cattle stalls, scratching posts and similar sources collected from three farms in Northern Ireland, one in Hertfordshire, and one in Cornwall where active cattle ringworm existed were found at the London School of Hygiene and Tropical Medicine to be infected with *Trichophyton discoides*. The evidence showed that spores of the fungus were present on a scratching post and other woodwork against which the animals rub and on the ground beneath. The spores remained viable in the laboratory at room temperature for 15 months (29 out of 50 samples) and it is probable they would have an equally long survival period in nature. From infected woodwork therefore man and susceptible animals could be infected. The fungus produced conidia on cultures on cow dung and soil. *T. discoides* has been increasing in prevalence on man in recent years in various parts of Great Britain and Northern Ireland.

1957. BAKERSPIGEL (A.) & BREMNER (R.). **Ringworm in Saskatchewan caused by *Trichophyton verrucosum*.**—*Canad. med. Ass. J.*, 73, 8, pp. 665–667, 1 fig., 1955.

Six cases of tinea caused by *Trichophyton verrucosum* (five in boys aged five to 14 and one in a 43-year-old farmer) are reported from the University Hospital, Saskatoon [cf. 2, No. 1109]. Five of the patients had been in contact with infected cattle.

1958. SELLERS (K. C.). **Cattle ringworm. Problems in the evaluation of treatment.**—*Analyt. Chem.*, 28, 2, p. 271, 1956.

At the Animal Health Trust Livestock Research Station, Stock, Essex, healthy calves were inoculated through the intact skin with natural material or culture suspensions of *Trichophyton verrucosum* var. *discoides* [cf. 2, No.

1417]. Lesions developed within 30 days and spontaneous recovery occurred in about four months, after which reinfection was resisted. Histological studies revealed a prolific distribution of mycelium in the extra- and intra-follicular stratum corneum during the early stages of infection. Later the follicular space round the hair was invaded and a loose mycelial network was formed round the hair shaft. Ultimately all parts of the intrafollicular portion of the hair became involved except the living bulb, and a spore sheath was produced both on the surface and in the medulla of the hair shaft, culminating in the separation of the stratum corneum from the underlying tissues.

From the outcome of these surveys and experimental studies it is concluded that, although satisfactory *in vivo* trials might be performed on inoculated calves, and would be well worth while in view of the prevalence of the disease, the final and accurate assessment of an antimycotic under field conditions presents many problems.

1959. POLEMANN (G.). **Histologische Untersuchungen zur experimentellen Hahnenkamm-Trichophytie.** [Histological studies on experimental Cock's comb trichophytosis.]—*Arch. klin. exp. Derm.* (formerly *Arch. Derm. Syph. Wien*), 202, 6, pp. 604–607, 2 figs., 1956.

From the University Skin Clinic, Cologne, Germany, the author describes histological studies with the Hotchkiss-McManus haemalum staining technique on the combs of 15 one-year-old Leghorn-Rhode Island cocks inoculated with *Trichophyton gallinae* [2, No. 1089 and above, No. 1954]. The growth of the fungus was found to be restricted to the stratum corneum, a fact which is no doubt responsible for the long duration of infection.

1960. BALABANOFF (V. A.). **Diagnostische Merkmale der Dermatophyten unter Berücksichtigung ihrer biologischen Differenzierung (Versuch einer systematischen Gruppierung).** [Diagnostic characters of the dermatophytes in relation to their biological differentiation (attempt at a systematic classification).]—*Zbl. Bakt., Abt. 1 (Orig.)*, 165, 4, pp. 251–263, 4 figs., 2 diags. 1956. [English, French, and Russian summaries.]

A new scheme for the classification of the dermatophytes is outlined, based on the different levels of specialization represented by the true parasites (e.g., *Achorion* [*Trichophyton*] *schoenleini*, *T. violaceum*, *Epidermophyton inguinale* [*E. floccosum*], the *T. tonsurans* group, *T. rubrum*, *Microsporum audouinii*, and *M. [Malassezia] furfur*); facultative saprophytes (such as *Ctenomyces* and *Sabouraudites*); and facultative parasites (represented, *inter alia*, by *Mucor*, *Candida*, *Aspergillus*, *Penicillium*, *Sporotrichum*, *Acremonium*, *Cryptococcus*, *Madurella*, and *Indiella* spp.).

1961. SWARTZ (H. E.) & GEORG (LUCILLE K.). **The nutrition of *Trichophyton tonsurans*.**—*Mycologia*, 47, 4, pp. 475–493, 5 figs., 1955.

In studies at the Communicable Diseases Center, United States Public Health Service, Chamblee, Georgia, the sporulating form of *Trichophyton tonsurans* [2, No. 170] was found to require thiamine for good growth. In the presence of thiamine the fungus grew best with an organic nitrogen source, though some growth was possible with ammonium nitrate at pH 5.8–6.2. Most isolates were not deficient in any one amino acid, but l-arginine, l-ornithine, l-proline, dl-serine, and dl-alanine gave greater stimulation of growth than any other amino acids tested. With ammonium nitrate as a nitrogen source, the utilization of various carbon compounds was tested. Glucose, mannose, fructose, galactose, cellobiose and trehalose supported the best growth. Testing for stimulation by thiamine is suggested as an aid in the identification of

morphologically atypical strains. That a number of named 'species' in the 'crateriform group' should have shown, as they did, similar requirements for thiamine is further evidence for equating all these forms with *T. tonsurans*.

1962. BLANK (F.) & TELNER (P.). **Note on the parasitic growth-phase of *Trichophyton rubrum* in hairs.**—*Canad. J. Med.*, 2, 3, pp. 402–403, 3 figs., 1956.

In this study, reported from the Department of Bacteriology and Immunology, McGill University, and the Department of Dermatology, Royal Victoria Hospital, Montreal, *Trichophyton rubrum* on hairs from the beard of a man with pustular folliculitis exhibited three habits of growth:—(1) the hair was surrounded by a network of septate hyphae; (2) the hair was thus surrounded, and in addition the cuticle was invaded by large arthrospores; and (3) septate, branching hyphae alone were found within the hair shaft. All three habits were interpreted as transitory stages leading to the ultimate endothrix habit, which was however not reached in this case.

1963. SAKAI (S.), SAITŌ (G.), KADA (T.), MURAOKA (N.) & SATŌ (A.). **Studies on chemotherapy of *Trichophyton* infections (II). Antifungal properties of halogen phenol ester and halogen phenol derivatives.**—*J. sci. Res. Inst., Tokyo*, 48, 1, pp. 38–48, 1 graph, 1955.

This is a tabulated survey of studies to determine the relative efficiency of fatty acid esters and ethers of numerous halogens in the inhibition of *Trichophyton* spp. *in vitro* and *in vivo* in inoculated guinea-pigs. The trihalogen phenol esters were the most effective, especially 2,4,5-trichlorophenol, the curative rates of 2,4,5-trichlorophenol caproate, 2,4,5-trichlorophenyl α -bromocaproate, and 2,4,5-trichlorophenyl ethyl malonate being computed at 92, 94, 95, and 95 per cent., respectively. The same group of esters also exerted a considerable degree of activity against [*Candida*] *albicans*.

1964. MARIAT (F.) & VIEU (M.). **Action fungistatique du propionate de sodium et du lauryl sulphate de sodium, leur synergie en association.** [Fungistatic action of sodium propionate and of sodium lauryl sulphate, their synergism in association.]—*Ann. Inst. Pasteur*, 91, 5, pp. 678–683, 1956.

Sodium propionate and sodium lauryl sulphate were each fungistatic to *Candida albicans*, *Trichophyton rubrum*, *T. mentagrophytes*, and *Epidermophyton floccosum* in the author's experiments, but a combination of the two greatly enhanced by their inhibitory properties, denoting the existence of a synergistic relationship. Neither singly nor in association did the compounds exert a fungicidal action.

1965. ORTENZIO (L. F.), STUART (L. S.), & FRIEDL (J. L.). **The practical value of mercury salts as disinfectants and fungicides for inanimate surfaces.**—*J. Ass. off. agric. Chem.*, 39, 2, pp. 476–479, 1956.

In *in vitro* experiments at the Agricultural Research Service, United States Department of Agriculture, Washington, D.C., *Trichophyton interdigitale* [2, Nos. 1685, 1686] was killed by ten-minute exposures to mercuric chloride, mercuric potassium iodide, phenylmercuric nitrate, phenylmercuric acetate, and phenylmercuric chloride at maximum dilutions of 1 in 4,500, 1 in 3,500, 1 in 2,900, 1 in 2,500, and 1 in 20,000, respectively.

1966. LITTMAN (M. L.). **Antimycotic effect of chlorquinaldol.**—*Trans. N.Y. Acad. Sci.*, Ser. II, 18, 2, pp. 161–177, 1 fig., 1 diag., 1 graph, 1956.

At the Mount Sinai Hospital, New York, chlorquinaldol (5,7-dichloro-8-hydroxyquinaldine), a substituted quinoline derivative, exerted a powerful inhibitory effect *in vitro* on the systemic fungal pathogens *Candida albicans*, *Histoplasma capsulatum*, *Blastomyces dermatitidis*, *Sporotrichum schenckii*,

Nocardia asteroides, and *Cryptococcus neoformans*, and the dermatophytes *Microsporum canis*, *M. audouinii*, *M. gypseum*, and a number of *Trichophyton* spp., including *T. mentagrophytes*, *T. rubrum*, *T. tonsurans*, *T. schoenleini*, and *T. violaceum*. The fungal activity of the compound in a 20 µg. per ml. concentration was reversed by the addition of a minute quantity (20 µg. per ml.) ferrous chloride, suggesting that chelation is concerned in the mechanism of its operation. The antimycotic properties of chlorquinaldol were only slightly impaired by horse serum, washed human erythrocytes, and human blood.

The topical application of 3 per cent. chlorquinaldol cream was well tolerated and proved effective in the cure, e.g., of foot infections caused by *T. mentagrophytes* and *T. rubrum*.

1967. FISCHER (E.). **Antigenanalytische und tierexperimentelle Untersuchungen zur Mykologie der Erreger der Interdigitalmykosen.** [Antigen-analytical and animal-experimental studies on the mycology of the agents of the interdigital mycoses.]—*Arch. klin. exp. Derm.*, 263, 3, pp. 276–310, 14 figs., 1956.

This is a very detailed, fully tabulated survey and discussion of intensive studies at the Dermatological Clinic of the University of Zürich, Switzerland, on the etiology of interdigital mycoses, involving inoculation experiments on guinea-pigs with 11 strains of the species formerly known as *Epidermophyton* Kaufmann–Wolf and *E. rubrum* and now generally referred on the basis of morphological and cultural characters to *Trichophyton interdigitale* and *T. rubrum*, respectively, and antigenic analyses by the Schultz–Dale test with the uterine cornu.

The two species infected the hair in the same way as typical representatives of the genus *Trichophyton*, and on these grounds their incorporation into the latter, in accordance with modern practice, is considered to be justified, notwithstanding discrepancies in antigenic structure between them and other *T.* spp.

1968. HUXLEY (M. JOAN) & HURD (R. C.). **Pink yeasts isolated from human skin surfaces.**—*J. Bact.*, 71, 4, pp. 492–493, 1956.

In an earlier study at the Department of Bacteriology and Public Health, State College of Washington, a number of pink yeasts (*Rhodotorula* and *Sporobolomyces* spp.) were isolated from various sites on normal human skin and were considered to be probably adventitious (Connel & Skinner, *J. Bact.*, 66, p. 627, 1953). The present authors report, from the same laboratory, studies on the identification of these yeasts, based on nitrate availability and a confirmatory auxanographic method. They consider that, in the present state of knowledge, the identification of species of *Rhodotorula* [see next entry] on physiological characteristics is unsatisfactory, and that as satisfactory morphological or tinctorial criteria are as yet also lacking the genus should provisionally be regarded as monotypic.

1969. BARZIZZA (C. M.) & RICARDI (E. A.). ***Rhodotorula* Harrison y dermatosis superficiales.** [*Rhodotorula* Harrison and superficial dermatoses.]—*Sem. méd., B. Aires*, 106, 5, pp. 115–120, 1955.

The authors review, for the benefit of laboratory workers and dermatologists, the morphological characters and classification of the genus *Rhodotorula* [see preceding entry], with notes on the characters of *R. minuta*, *R. mucilaginis*, and *R. rubra*. After an analysis of the literature they outline the role of these fungi as agents of superficial dermatoses, and give brief notes on the 31 cases which formed the basis of this study from the Microbiological Institute, Faculty of Medical Sciences, Buenos Aires. A *Rhodotorula* sp. was

the sole disease agent in 13 cases; in the rest it was combined chiefly with *Micrococcus* [*Staphylococcus*] *aureus*. In another series of 679 cases of superficial dermatoses *Rhodotorula* was the sole agent in only 31. In Buenos Aires *R. minuta* is the commonest representative of the genus.

1970. MOLINARI (R.). **Di un particolare quadro trofoallergico secondario ad epidermomicosi da *Trichophyton schoenleini*.** [On an unusual tropho-allergic secondary aspect of the epidermomycosis caused by *Trichophyton schoenleini*.]—*G. ital. Derm. Sif.*, 97, 1, pp. 69–78, 1956. [French, English, & German summaries.]

From the Dermatological Clinic of the University of Ferrara, Italy, the author reports a case of tropho-allergic reactive oedema of the feet and legs, secondary to infection of the feet by *Trichophyton schoenleini*, in a 42-year-old male patient. The course of the complaint, which presented noteworthy clinical, histological, and etiopathological features, ran parallel with periods of improvement and relapse in the original mycosis, but ultimately the allergic manifestation assumed a clinically more stable character.

1971. SMITH (L. M.) & GARRETT (H. D.). **Generalized ringworm infections : report of a case due to *Epidermophyton floccosum*.**—*Sth. med. J.*, Nashville, 49, 4, pp. 337–342, 6 figs., 1956.

Following a review of 12 contributions to the literature on generalized tinea infections, the authors fully report from El Paso, Texas, a case of this type of one year's duration caused by *Epidermophyton floccosum* in a 20-year-old male Mexican. Unusual features included infection of the toe-nails; almost total involvement of the face, with an exudative dermatitis; confluence of the major portion of the eruption, with no central clearing and only an occasional sharp border; marked inguinal adenopathy; and severe and deep histopathological reactions. The patient responded favourably to local medication, principally with asterol, salundek, and half-strength Whitfield's ointments.

1972. WALTHER (H.). **Beitrag zur kosmetisch nichtstörenden Epidermophytie-Therapie.** [Contribution to the cosmetically acceptable therapy of epidermophytosis.]—*Ther. Gegenw.*, 94, 8, pp. 299–300, 1955.

From Pforzheim, Germany, the author reports the successful treatment of epidermophytia palmaris et plantaris (*Epidermophyton* [*Trichophyton*] *interdigitale*) and other dermatomycoses with a combination of 2 per cent. 5-bromosalicyl-4'-chloranilide and 1 per cent. soventol-salicylate, known as multifungin.

1973. SCHERR (G. H.), KORTH (Z. N.), REYNOLD (J.) & GOTHAM (J. E.). **The therapeutic effect of fatty acids and the antibiotic M-11 on tinea pedis.**—*J. invest. Derm.*, 25, 5, pp. 335–340, 1955.

An investigation into the therapeutic effect of sopronol, a fatty acid preparation, and M-11, an antifungal antibiotic obtained from a *Streptomyces* sp., on tinea pedis in a boys' residential home and among a group of medical students, is described from the Creighton University School of Medicine, Omaha, Nebraska. All cases included in the results were either microscopically or culturally positive for fungi, but the fungi isolated are not named. It was found that the mixture of the two medicaments resulted in a significantly greater number of cured or improved patients, for all degrees of severity of infection, than either of the preparations used alone, and the average time taken to achieve a cure was approximately one week less with the mixture. It is considered that the data warrant extended clinical trials with the mixed preparation.

1974. PEREZ CORNEJO (S.). **Contribución al estudio micológico de la tiña del Caballo.** [Contribution to the mycological study of tinea of the Horse.]—*Zoosíntesis*, Chile, 3, 11, pp. 7–17, 3 figs., 1954.

Following a review of 36 contributions to the literature on equine tinea, the author describes the methods and results of mycological studies on 39 specimens at the Institute of Veterinary Investigations, University of Chile, Santiago. Direct examination of the hairs and squamæ yielded positive results in 15 cases and negative in five. The fungus developing in the 21 positive cultures on Sabouraud's honey or maltose agar was identified as *Trichophyton mentagrophytes*.

1975. NORDÉN (Å.). **The role of temperature in a *Sporotrichum* precipitin reaction.**—*Proc. seventh int. bot. Congr., Stockholm, 1950*, p. 422, 1953.

In investigations carried out in Sweden, the author, using a polysaccharide and a crude autoclaved antigen from *Sporotrichum schencki*, studied the precipitin reaction at 5.5° to 8°, 24°, and 35° to 36° C. with a Libby photron-reflectometer. During the first few minutes flocculation was most rapid at the higher temperatures, but later on it was fastest at the lower.

1976. KADEN (R.). **Präzipitation von *Sporotrichon*-Antiserum im Agarmedium.** [Precipitation of *Sporotrichum* antiserum in an agar medium.]—*Z. Haut- u. Geschlechtskr.*, 21, 4, pp. 87–95, 4 figs., 1 diag., 1956.

The method of precipitation in an agar medium, which was primarily devised for bacteriological work (*J. Immunol.*, 73, p. 232, 1954; *Z. Hyg. Infektkr.*, 141, p. 110, 1955), was successfully adapted by the author to immune-serological studies on *Sporotrichum schencki* antiserum, using brain-heart infusion-blood.

1977. CARRIÓN (A.) & SILVA (MARGARITA). **Sporotrichosis. Special reference : a revision of so-called *Sporotrichum gougerotii*.**—*Arch. Derm. Syph., Chicago*, 72, 6, pp. 523–534, 7 figs., 1955.

On the basis of studies at Columbia University, New York, the authors conclude that *Sporotrichum gougerotii* does not belong to the genus *Sporotrichum* both because it is invariably black and may be classed among the 'black yeasts' and because it gives off blastospores in succession from a common meristematic point, whereas in *Sporotrichum* each spore is produced singly. In infected tissues the fungus produces abundant, large, spherical, pigmented, coarse-walled cells which multiply by septation and cleavage, and also branched moniliform filaments reminiscent of *Cladosporium* sporulation. The species sporulates like *Pullularia* and *Cladosporium* and is specifically characterized by producing phialides which abstrict spores at the apex, without terminal receptacles of any kind. On the basis of these characters the species is renamed *C. gougerotii* (Matruchot) n.comb.

1978. LIU (C. L.). **Sporotrichosis : report of a case.**—*Chin. med. J.*, 73, 4, pp. 330–336, 8 figs., 1956.

A case of lymphatic sporotrichosis (*Sporotrichum schencki*) of the left forearm with pulmonary involvement in a 36-year-old housewife is reported from the Shantung Medical College, Tsinan, China, the fungus having been isolated from pus and sputum on Sabouraud's, maize meal, and blood cystine agars. Confirmatory evidence of identity was also furnished by agglutination and complement-fixation tests. The lesions induced by inoculation of the organism into Chinese hamsters and white mice contained fusiform elements. The oral administration of potassium iodide resulted in the disappearance of the subcutaneous nodules; after 20 days it was replaced by sodium iodide on account

of intolerance and by the end of six months there was a marked regression of the pulmonary lesions.

1979. MINTY (C. C. J.), MEAD (M.), & McCaffrey (M. F.). **Sporotrichosis : a case report from Queensland.**—*Med. J. Aust.*, 43 (i), 17, pp. 704–705, 1956.

A case of sporotrichosis (*Sporotrichum schencki*) in a 72-year-old male, following an injury to the left wrist, is described from the Brisbane General Hospital, the first record for Queensland [cf. 2, Nos. 175, 180]. A yeast-like phase of the fungus, consisting of elliptical, budding cells, 2.5 to 4 by 1.5 to 2.5 μ , with a little mycelium, developed on glucose-cystine-blood agar at 35° C.

1980. AJELLO (L.). **Recent advances in medical mycology.**—*Bull. nat. Ass. clin. Lab.*, 7, 1, pp. 11–16, 1955.

Following the discovery that the soil is the natural habitat of a number of pathogens the U.S. army has been able to reduce significantly the incidence of coccidioidomycosis (*Coccidioides immitis*) among personnel in the south-western states by controlling dust [1, No. 720]. Studies have shown that soil and buildings containing the faeces of fowls [2, No. 1259] and pigeons frequently constitute sources of histoplasmosis (*Histoplasma capsulatum*).

In the field of therapy, 2-hydroxystilbamidine [2, Nos. 1211, 1785] has proved singularly effective in the treatment of North American blastomycosis [*Blastomyces dermatitidis*] and fatty acids (propionic, caprylic, and undecylenic [1, Nos. 397, 398]) are useful against tinea corporis and tinea pedis. There is still an urgent need for effective substances for the treatment of tinea capitis and onychomycosis.

In the diagnosis of *Candida albicans* Nickerson's 'chlamydospore agar' [2, No. 341] has given consistent results.

G. Moffitt, in a personal communication from the Tennessee State Department of Health, reports that he has developed an effective mouse inoculation procedure, followed by culture of liver and spleen samples on Sabouraud's dextrose agar, for the isolation of *H. capsulatum* from sputum and from bronchial and gastric washings. In comparative tests this produced three times as many isolates as the direct inoculation of media.

1981. CONANT (N. F.) & SMITH (D. T.). **Diagnosis of mycotic infections. I. Superficial mycoses.**—*Merck Rep.*, 64, 4, pp. 19–24, 9 figs., 1955.

SMITH (D. T.) & CONANT (N. F.). **Diagnosis of mycotic infections. II. Deep mycoses of the lungs and other internal organs. III. Deep mycosis of mucous membranes, skin and subcutaneous tissues.**—*Merck Rep.*, 65, 1, pp. 19–24; 2, pp. 22–24, 1956.

These articles provide a succinct and well illustrated résumé of classification and differential diagnosis of the most important superficial and deep mycoses. The classification followed is that presented by the present authors and others in the 'Manual of Clinical Mycology' (W. B. Saunders Co., Philadelphia and London, 1954).

1982. **Mold and fungous diseases. A growing public health problem.**—*Consumer Reps*, 20, pp. 45–50, 3 figs., 1955.

In this paper, prepared in consultation with M. L. Littman, Department of Microbiology, Mount Sinai Hospital, New York, up-to-date information on coccidioidomycosis (*Coccidioides immitis*), histoplasmosis (*Histoplasma capsulatum*), candidiasis caused by *Candida albicans*, sporotrichosis (*Sporotrichum schencki*), actinomycosis (*Actinomyces israeli*), cryptococcosis (*Cryptococcus neo-*

formans), and North American blastomycosis (*Blastomyces dermatitidis*) in the United States is presented in semi-popular terms.

1983. MARCUS (S.), NIELSON (BETTY D.), & RAMBO (FRANCES R.). **Isolation of systemic mycotic pathogens: qualitative and quantitative aspects.**—*J. Bact.*, 72, 4, pp. 473–477, 2 figs., 1956.

At the Department of Bacteriology, University of Utah, Sabouraud's dextrose agar and nutrient blood agar with and without added penicillin, aerosporin, and streptomycin, were compared for their suitability for the initial isolation of *Candida albicans*, *Cryptococcus neoformans*, *Histoplasma capsulatum*, *Blastomyces dermatitidis*, *Sporotrichum schenckii* and *Geotrichum candidum*. Yeast phase strains, suspended in brain-heart infusion broth and fungus-free stored sputum at dilutions providing 10^3 , 10^4 , 10^5 , and 10^6 'population units' per ml., were inoculated by loop into the four quarters of plates of the media, and comparison based on the lowest concentration yielding grossly visible colonies in a week. With sputum the antibiotic blood agar was best for isolation of *H. capsulatum*, *B. dermatitidis*, and *C. neoformans*. With broth plain nutrient blood agar was more sensitive for *H. capsulatum* than Sabouraud's agar.

1984. BEAMER (P. R.). **Immunology of mycotic infections.**—*Amer. J. clin. Path.*, 25, 1, pp. 66–75, 3 figs., 1955.

In this paper from the Indiana University School of Medicine, Indianapolis, the immunology of the mycoses is briefly reviewed.

1985. VANBREUSEGHEM (R.). **Les mycoses post-antibiotiques.** [Post-antibiotic mycoses.]—*Bru. méd.*, 36, 42, pp. 1987–1998, 1956.

Reviewing the literature of the last six years in the light of his own experience the author considers that the side effects of broad-spectrum antibiotics fall into two groups. The first includes a 'pharmacodynamic' action increasing the excretion from the body of certain vitamins [Gabuzda *et al.*: *J. clin. Invest.*, 31, p. 631, 1952; 32, p. 570, 1953] and possibly, by disturbance of the mechanism of secretion of A.C.T.H. and cortisone, inhibiting inflammatory reaction and so favouring the spread of fungi [cf. 2, Nos. 1332, 1619 *et passim*]. The second includes the suppression of the intestinal flora resulting in the loss of synthesized vitamins and the encouragement of fungal strains resistant to the antibiotic [cf. 1, No. 1942; 2, No. 1580, *et passim*]. He points out that although it is generally assumed that mucous membranes deprived of their normal vitamin reserves are prone to fungus invasion, there has as yet been no experimental proof of this.

From the therapeutic standpoint it is important that where broad spectrum antibiotics are used, vitamin B and a fungistatic drug such as nystatin [mycostatin] should also be administered.

1986. SCHWABE (C. W.). **Present knowledge of the systemic mycoses in Dogs: a review.**—*Vet. Med.*, 49, pp. 479–486, 490, 9 figs., 1954.

The essential features of histoplasmosis (*Histoplasma capsulatum*), North American blastomycosis (*Blastomyces dermatitidis*), coccidioidomycosis (*Coccidioides immitis*), actinomycosis (*Actinomyces bovis*), nocardiosis (*Nocardia asteroides*), cryptococcosis (*Cryptococcus neoformans*) and mucormycosis (*Mucor* sp.) in dogs are concisely summarized. There is a bibliography of 78 references.

1987. FAGAN (R.). **Systemic fungous infections in Dogs.**—*Proc. Ann. Meet. Amer. vet. med. Ass.*, 1955, pp. 280–286, 1955. [*V.B.*, 26, No. 3416.]

The author discussed the symptoms, prevalence, epidemiology, diagnosis

and treatment of coccidioidomycosis [*Coccidioides immitis*], histoplasmosis [*Histoplasma capsulatum*], blastomycosis [*Blastomyces dermatitidis*], and cryptococcosis [*Cryptococcus neoformans*] in dogs. Three cases of the last infection are described.

1988. MCKINNON (A. S. M.). **Annual Report of the Department of Animal Health, Gold Coast, 1954-55**, pp. 6, 7, 1956.

Aspergillosis [*Aspergillus fumigatus*] of fowls and ducks, and favus [? *Trichophyton gallinae*, cf. 2, No. 1089] of fowls are reported. Prevention by sound hygiene and control by decontamination of infected premises and/or the treatment of affected birds are envisaged.

Epizootic lymphangitis [*Histoplasma farciminosum*] is endemic throughout the territory but only 27 cases were seen during the year.

1989. BRICENO MAAZ (T.), & DE BRICENO MAAZ (C.). **Investigaciones micológicas en el Estado Anzoátegui, Venezuela**. [Mycological studies in the State of Anzoátegui, Venezuela.]—*Gac. méd. Caracas*, 63, 7-11, pp. 365-367, 1955.

In a very brief note the organisms responsible in one hundred mycotic infections are listed, the most frequent being *Trichophyton rubrum* (31 cases), *Malassezia furfur* (23), and *T. mentagrophytes* (21). *M. furfur* is stated to be very common in young adults. *Aspergillus niger* was isolated, sometimes alone, from 11 out of 31 cases of otitis externa.

1990. VANBREUSEGHEM (R.). **Overzicht der mycosen in het algemeen en die van Belgisch Congo in het bijzonder**. [Survey of the mycoses in general and those of the Belgian Congo in particular.]—*Belg. Tijdschr. Geneesk.*, 1955, 14, pp. 681-690, 1955.

The information herein presented on mycoses in the Belgian Congo has already been noticed from other sources [2, No. 1137 *et passim*].

1991. DI MENNA (MARGARET E.). **Non-pathogenic yeasts of the human skin and alimentary tract. Comparative survey**.—*J. Path. Bact.*, 68, 1, pp. 89-99, 1954.

At the Microbiological Department, Otago University, New Zealand, groups of 278 children and 152 young adults were examined by swabbing the throat, fingernails, and skin, and in 87 of the adults by scraping the scalp. Faeces from the children were examined, and surfaces in rooms used by members of each group were swabbed. Cultures were made on Sabouraud's medium and direct examination was used for the scalp specimens only. Air samples were taken, mostly from one room used by the adult group. Sixteen species of yeast were identified from the oral cavity, *Candida albicans* accounting for more than 80 per cent. of the isolations. This organism was responsible for two-thirds of the isolations from faeces. *Debaryomyces*, *Cryptococcus*, *Rhodotorula* and the yeast-like phase of *Cladosporium* were the predominant genera on the skin and from the environment. Eighty-two of the 87 cases of dandruff among the adult groups yielded organisms morphologically typical of *Pityrosporum*.

1992. SEELIGER (H.). **Mykologie und Serologie der Pneumomycosen**. [Mycology and serology of the pneumomycoses.]—*Tuberkulosearzt*, 9, 8, pp. 451-463, 7 figs., 1955. [English, French, and Spanish summaries.]

The theme of the author's lecture to a gathering of the Rhenish-Westphalian Tuberculosis Association at Düsseldorf on 26th March, 1955, was the insufficiency of clinical procedures for the diagnosis of the increasingly frequent pulmonary mycoses. Essential to the recognition of both the endo- and exogenic groups of diseases, the former represented, e.g., by actinomycosis (*Actinomyces israeli*) and moniliasis (*Candida albicans* and related species),

and the latter, for example, by the ubiquitous aspergillosis (*Aspergillus fumigatus*) is the co-operation of special laboratories. Identifications should be made both by microscopic and cultural methods, supplemented if necessary by animal inoculation experiments and completed by the demonstration of antibodies (agglutination, haemagglutination, precipitation, and complement-fixation with the respective antigens) and of cutaneous allergy to extracts of pathogenic fungi. The evaluation of positive results necessitates the application of very exacting standards.

1993. FERGUSON (G. B.). **Mycotic diseases of the lower respiratory tract.**—*Ann. Otol., etc., St. Louis*, 64, 4, pp. 1245–1260, 6 figs., 1955.

This report is based for the most part on cases of pulmonary mycosis seen at the Duke Hospital, Durham, North Carolina, between 1930 and 1953, inclusive, and comprises 15 due to *Actinomyces bovis* [*A. israeli*]; three each to *Nocardia asteroides* and *Aspergillus* spp.; 29 to *Blastomyces dermatitidis* (and two more involving the larynx and trachea); six to *Coccidioides immitis*; two to *Cryptococcus neoformans*; eight (probably) to *Histoplasma capsulatum*, judging by the strongly positive reactions to histoplasmin skin tests; and 62 to *Candida albicans*.

1994. TRIGLIANOS (A.). **Quelques remarques bronchoscopiques sur les mycoses broncho-pulmonaires.** [Some bronchoscopic observations on broncho-pulmonary mycoses.]—*Poumon*, 10, 10, pp. 759–766, 1954.

Information is summarized on the bronchoscopic aspects of three groups of broncho-pulmonary mycoses. The first comprises moniliasis (*Candida albicans* and *C. tropicalis*) and torulosis (*Torula* or *Torulopsis* [*Cryptococcus*] *neoformans*). The second consists of actinomycosis (*Actinomyces israeli* and *A. bovis*) and *Nocardia* sp., aspergillosis (*Aspergillus fumigatus*, *A. brodeni*, and *A. niger*), North and South American blastomycoses (*Blastomyces dermatitidis* and *B. [Paracoccidioides] brasiliensis*), coccidioidomycosis (*Coccidioides immitis*), haplomycosis (*Haplosporangium parvum*), and sporotrichosis (*Sporotrichum schencki*). The mycoses forming the third group may result from infection by species of *Actinomyces*, *Nocardia*, *Aspergillus*, *Blastomyces*, or *Coccidioides*.

1995. LOBO (J.). **Blastomycoses.**—*Ann. Derm. Syph., Paris*, 82, 4, pp. 377–387, 4 figs., 1955.

Information is presented on the diseases of Busse-Buschke (*Cryptococcus neoformans*), Gilchrist (*Blastomyces dermatitidis*), Posadas-Rixford (*Coccidioides immitis*), Lutz-Splendore-Almeida (*Paracoccidioides brasiliensis*), and Jorge Lobo (*Glenosporella lobo*) [I, Nos. 894, 911], with special reference to the last-named.

1996. MOORE (M.). **Morphologic variation in tissue of the organisms of the blastomycoses and of histoplasmosis.**—*Amer. J. Path.*, 31, 6, pp. 1049–1063, 5 pl., 1955.

In a paper on the growth and development of yeast-like organisms the author discusses the micro- and macroforms of *Blastomyces dermatitidis*, *Paracoccidioides brasiliensis*, *P. tenuis*, *P. cerebriformis*, and *Histoplasma capsulatum*, known to occur in tissue, and stresses that if cultures are not made there is danger of confusing microforms of *B. dermatitidis* with usual forms of *H. capsulatum*, or macroforms of the latter with the usual form of the former.

He reports the finding of filaments of *Cryptococcus neoformans* (resembling the germ-tubes in primary cultures) in necrotic liver tissue from an unreported case of systemic cryptococcosis.

Filament formation *in vivo* by *H. capsulatum* was also demonstrated in an endocardial vegetation from an unpublished case of Dominguez and Golden at St. Luke's Hospital, Cleveland, Ohio.

Multiple budding may be demonstrated *in vitro* in *B. dermatitidis*, *Sporotrichum schencki* and *C. neoformans*, as well as in *Candida albicans* and *Saccharomyces cerevisiae* grown in media containing either sodium fluoride (1:10³ to 1:10⁵) or sodium silicofluoride (1:10⁴ to 1:10⁵).

1997. SCHMITZ (H.) & WOODSIDE (R.). **Mycolutein, a new antifungal antibiotic.**—*Antibiot. & Chemother.*, 5, 11, pp. 652–657, 1 diag., 2 graphs, 1955.

At the Research Laboratories of J. T. Baker Chemical Co., Phillipsburg, New Jersey, mycolutein, a yellow crystalline compound isolated from an apparently unidentified species of *Streptomyces* in soil, inhibited the growth of various fungi, including *Candida albicans*, *C. tropicalis*, and *Geotrichum* sp., at concentrations of the order of 1 μ gm. per ml.

1998. KADEN (R.). **Vitamine und Pilzwachstum.** [Vitamins and fungus growth.]—*Arch. Derm. Syph., Wien*, 200, pp. 356–360, 3 figs., 1955.

Reporting to the 22nd meeting of the German Dermatological Society at Frankfurt-am-Main on 17th September, 1953, the author states that the growth in pure culture of *Epidermophyton Kaufmann-Wolf* [*Trichophyton interdigitale*] was not affected by the addition to the medium of vitamins of the B series. *Candida albicans*, on the other hand, responded to the same procedure by a heavy increase in growth, especially in cultures supplemented by a combination of liver extract and vitamin B₁₂.

1999. SEELIGER (H. P. R.). **Fortschritte in der Chemotherapie disseminierter Mykosen.** [Advances in the chemotherapy of disseminated mycoses.]—*Dtsch. med. Wschr.*, 81, 50, pp. 2041–2045, 1956.

In this brief review article the author deals separately with progress in the chemotherapy of the important mycoses. There is a bibliography of 104 recent references.

2000. SMITH (D. T.). **Therapy for pulmonary and systemic fungus diseases.**—*Postgrad. Med.* 20, 1, pp. 18–25, 1956.

This is a review of 20 contributions to the literature on up-to-date methods of therapy for actinomycosis (*Actinomyces bovis*) [*A. israeli*], nocardiosis (*Nocardia asteroides* and other *N. spp.*), North American blastomycosis (*Blastomyces dermatitidis*), coccidioidomycosis (*Coccidioides immitis*), histoplasmosis (*Histoplasma capsulatum*), cryptococcosis (*Cryptococcus neoformans*), sporotrichosis [*Sporotrichum schencki*], candidiasis caused by *Candida albicans*, geotrichosis (*Geotrichum candidum*), aspergillosis (*Aspergillus fumigatus* and other *A. spp.*), and mucormycosis (*Mucor spp.*).

2001. SCHATZ (A.), SCHATZ (V.), & TRELAWNY (G. S.). **Antifungal properties of tetrazolium compounds.**—*Mycologia*, 48, 4, pp. 473–483, 1956.

The results of tests at the National Agricultural College, Doylestown, Pennsylvania, on 16 tetrazolium compounds on seven fungi pathogenic to man and four non-pathogenic suggest that, despite their general toxicity to higher animals, the compounds may justify consideration as agents for the external treatment of dermatophytic infections.

Inhibition of growth and reduction of tetrazoliums to formazans were ascertained to be independent phenomena. It is concluded that the interrelation-

ships between tetrazolium compounds and biological systems are more complex than they were formerly believed to be. Possible applications of tetrazolium derivatives to isolation work, diagnosis, and physiological studies of pathogenic fungi are discussed.

2002. ILUKEWITSCH (A.) in collaboration with RUEHS (G.). **Experimentos fungistáticos 'in vitro' con 71 distintos productos químicos. Nuevas sustancias inhibidoras para los hongos : *Histoplasma capsulatum*—Darling (1906) y *Blastomyces brasiliensis*—Conant y Howell (1941).** [Fungistatic experiments *in vitro* with 71 different chemical products. New substances inhibitory to the fungi *Histoplasma capsulatum* Darling (1906) and *Blastomyces brasiliensis* Conant & Howell (1941).]—*Rev. Sanid. Asist. Soc.*, 20, 5-6, pp. 339-364, 2 figs., 1955.

Of the 71 chemicals tested at the National Institute of Tuberculosis, Caracas, Venezuela, the following exerted the most powerful fungistatic effects on *Histoplasma capsulatum* and *Paracoccidioides brasiliensis*: resublimated iodine, brilliant green, and ortho-phenanthroline, all of which inhibited the growth of both species at levels of 2.5 mg. per 100 ml.; karitin (bisulphate of menadione, 2-methyl 1, 4-naphthoquinone), beta-naphthol, oxine (8-oxyquinoline), and salicylaloxim (all at 5 mg.); betanaphthoquinoline, 5, 7-dibromo-8-oxyquinoline, 5-dichloro-7-iodo-8-oxyquinoline, beta-nitroso-alpha-naphthol, and alpha-alpha-diperidyl (all at 10 mg.); caprylic acid (10 mg. for *H. capsulatum* and 20 for *P. brasiliensis*); N-(1-naphthyl)-ethylenediamine (20 and 10); zinc undecylenate and isonitrosoacetophenone (20 for both); and stilbamidine (tested on *P. brasiliensis* only, 20).

2003. COOKE (W. B.) & KABLER (P.). **Isolation of potentially pathogenic fungi from polluted water and sewage.**—*Publ. Hlth Rep., Wash.*, 70, 7, pp. 689-694, 1955.

In an investigation at the Robert A. Taft Sanitary Engineering Center, Cincinnati, from 1952 to 1953, *Allescheria boydii*, *Aspergillus fumigatus* and *Geotrichum candidum* were isolated from polluted water, sewage and associated habitats in South-Western Ohio.

2004. PLOWRIGHT (W.). **Cutaneous streptothricosis of Cattle. I. Introduction and epizootiological features in Nigeria.**—*Vet. Rec.* 68, pp. 350-355, 2 figs., 2 graphs, 1956.

In an epidemiological study of cutaneous streptothricosis [caused by unidentified aerobic actinomycetes] in 110 Zebu cattle during the rainy season at Vom, Nigeria, in 1954, particular attention was paid to the ears and poll, neck, hump, withers and midback, which are the commonly reported sites of infection, and also to the brisket, axilla, inguinal region, scrotum, udder, and escutcheon. Seventy per cent. developed lesions at one or more of these sites. Body lesions were found in only 15 per cent., and never alone, being always associated with lesions at the aforementioned sites. The incidence of infection was highest at the axilla (including the brisket), groin, scrotum, and udder, all of which are favoured sites of attachment for the predominant tick species, *Boophilus decoloratus* and *Amblyomma variegatum*. The latter was present throughout the period of study (21st June to 5th August).

In 1955 two comparable groups of cattle, each of 20 cattle free from infection at the beginning of the rainy season on 1st April, were grazed together, one group being kept free from tick infestation by dipping in gammexane twice weekly while the other was allowed to develop heavy infestation. By the fifteenth week all infested animals were clinically infected with streptothricosis, while all in the group free from ticks were also free from infection.

2005. DE MAGALHÃES (O.). **Ensaios de micologia.** [Mycological experiments.]—*Mem. Inst. Osw. Cruz*, 53, 2-4, pp. 301-312, 5 figs., 1955. [English summary.]

From the pus of two cases of dacryo-canaliculitis at the Hospital São Geraldo, Rio de Janeiro, Brazil, the author isolated a species of *Actinomyces* which was identified on the basis of its morphological and cultural characters as *A. silberschmidti* Chalmers & Christopherson 1916 and compared with *A. forsteri*, *A. bovis*, and *A. [Nocardia] brasiliensis*. A three-page bibliography is appended.

2006. SUTER (L. S.). **Evaluation of criteria used in the identification of *Actinomyces bovis* with particular reference to the catalase reaction.**—*Mycopathologia*, 7, 3/4, pp. 220-228, 6 figs., 1956.

The author reports from the Veterans' Administration Medical Teaching Group Hospital, Memphis, Tennessee, an examination of the criteria used to define *Actinomyces bovis* [*sensu lato*]. As useful criteria he accepts roughness and smoothness; colony form on brain heart infusion (B.H.I.) difco (2 per cent. agar); oxygen requirements; adherence to agar; growth rate in B.H.I.; odour in B.H.I.; ease of emulsification; and the catalase reaction. He rejects as of little use Gram staining; branching; filaments, clubs, and clusters; production of hydrogen sulphide; viability following serial transfer in B.H.I.; penicillin sensitivity; and pathogenicity for mice.

A major difficulty in identification has been to draw the line between the smooth type of *A. bovis* and the anaerobic diphtheroids [cf. 1, No. 2081]. In this respect the catalase reaction has proved very useful, the author finding that much effort is saved where it is used as a routine in the preliminary testing of colonies suspected to be *A. bovis*.

2007. HOWELL (A.) & PINE (L.). **Studies on the growth of species of *Actinomyces*. I. Cultivation in a synthetic medium with starch.**—*J. Bact.*, 71, 1, pp. 47-53, 3 figs., 1956.

From the National Institutes of Health, Bethesda, Maryland, the authors report the successful culture of *Actinomyces israeli* on a liquid synthetic medium containing purified potato starch [cf. 2, No. 212].

2008. JOHNSON (C. MARGARET C.), DE VRIES (JOAN), & STEVENSON (J. W.). **A lymphocytopenia producing factor from *Nocardia*.**—*Canad. J. Microbiol.*, 2, 3, pp. 380-392, 3 graphs, 1956.

Nine soil isolates, provisionally identified as *Nocardia*, produced severe lymphocytopenia when injected intramuscularly in heavy suspension into rabbits.

An active principle was isolated which by qualitative biochemical tests and paper chromatography was found to consist of reducing sugars and a non-reducing fraction represented by a 'uronic' or 'onic' acid having the reactions of a sugar acid. From its haematological activity and chemical nature the active principle appears to belong to the 'pyrogenic' polysaccharides.

2009. LUDWIG (T. G.). **Actinomycosis originating in the maxillary region.**—*Oral Surg.*, 8, 8, pp. 877-880, 1955.

From the Institute of Dental Research, Sydney, Australia, the author reports a case of actinomycosis (caused by a slightly atypical strain of *Actinomyces israeli*) of the soft tissues of the maxillary region in a 35-year-old woman.

2010. CERNEA (P.), GARLOPEAU (F.), & MARIE (M.). **L'actinomycose cervico-faciale. Considérations sur l'évolution des formes ptérygo-maxillaires.** [Cervico-facial actinomycosis. Considerations on the evolution of the pterygo-maxillary forms.]—*Rev. Stomatol., Paris*, 56, 5-6, pp. 390-395, 1955.

Full clinical details are given of two cases of cervico-facial actinomycosis, in one of which *Actinobacterium* [*Actinomyces*] *israeli* was associated with *Fusocillus girans*, an anaerobic organism which is itself pathogenic. Massive doses of penicillin, continued for upwards of a month, were the most effective form of therapy.

2011. KNAKE (H. J.) & ZEISS (K. H.). **Primäre Abdominalaktinomykose mit sekundärer Ausbreitung auf beide Tuben und Netz.** [Primary abdominal actinomycosis with secondary spread to both the fallopian tubes and the omentum.]—*Geburtsh. u. Frauenheilk.*, 15, 9, pp. 816–822, 1 fig., 1955.

From Detmold, Germany, the authors report and discuss in connexion with the relevant literature a case of primary abdominal actinomycosis (*Actinomyces* [*israeli*]), with secondary spread to the fallopian tubes and omentum, in a 16-year-old schoolgirl. An excellent post-operative recovery was made with the assistance of antibiotics (penicillin, supronal, and terramycin), potassium iodide, and X-ray irradiation.

2012. WEBSTER (B. H.). **Pulmonary nocardiosis. A review with a report of seven cases.**—*Amer. Rev. Tuberc.*, 73, 4, pp. 485–500, 7 figs., 1956. [Spanish and French summaries.]

Seven cases of pulmonary infection by *Nocardia asteroides* are reported from Nashville, Tennessee. In three of the patients the symptoms simulated those of apical tuberculosis; in one a non-tuberculous bacterial pneumonia of the right upper lobe; in another, pneumonia of the right middle lobe. An abscess of the left lower lobe was present in one of the remaining cases, and in the other (whose illness originated with a rose-thorn injury to the right hand, which healed spontaneously) multiple honeycombed cavities occurred in both upper lobes.

Four of the patients are presumed to have been cured by sulphadiazine therapy, while three were still undergoing treatment at the time of writing.

A review of the pertinent literature revealed only 44 cases of pulmonary involvement in nocardiosis.

2013. THOMAS (P. A.) & PULASKI (E. J.). **Pulmonary nocardiosis. Report of case successfully treated with sulfadiazine.**—*Antibiot. Med.*, 3, 1, pp. 65–73, 7 figs., 1 graph, 1956.

From the Tripler Army Hospital, San Francisco, California, a case is reported of pulmonary suppuration due to *Nocardia asteroides* in a 33-year-old merchant seaman, with presumptive haematogenous spread to the left calf, causing ulceration. The consistently downward clinical course attested the inadequacy of antibiotic and other forms of therapy, but a complete and probably permanent cure was ultimately effected by sulphadiazine [cf. 1, Nos. 257, 2060], administered in daily doses of 8 gm. (total of 1,168) over a five-month period.

2014. DAMGAARD-MØRCH (P.). **Abdominal actinomycosis. Three cases of atypical localization.**—*Acta chir. scand.*, 110, 6, pp. 458–463, 4 figs., 1956.

This is a clinical report and discussion of three cases of actinomycosis (*Actinomyces* [*israeli*])—two renal and one gastric—in patients at the State Hospital, Copenhagen, Denmark, all of whom were cured by excision of the resultant tumours.

2015. HALDE (C.) & RINGROSE (E. J.). **Mycetoma originating in northern California. Disease caused by a fungus resembling *Nocardia madurae*.**—*Arch. Derm. Syph.*, Chicago, 74, 1, pp. 80–85, 6 figs., 1956. [*T.D.B.*, 54, p. 221.]

A fungus resembling *Nocardia madurae* was isolated from a mycetoma of the right foot of a female patient resident in northern California. The infection, which was of ten years' standing, showed clinical improvement on treatment with sulphonamides.

2016. MANOCCHIO (I.). **Granuloma eosinofilico faringeo e polmonare in bovino con reperti di *Nocardia-asteroides*.** [Granulomatous eosinophilic lesions of the pharynx and lungs of an ox, associated with *Nocardia asteroides*.]—*Atti Soc. ital. Sci. vet. Palermo*, 9, pp. 420–424, 1956. [English and French summaries.] [*V.B.*, 26, No. 2830.]

Two nodules the size of small oranges were found in the pharynx of a 5-year-old ox slaughtered on account of respiratory distress. Histological examination showed these to be eosinophilic granulomata, and *Nocardia asteroides* was isolated from both.

2017. WITT (O.). **Zur Behandlung der fortgeschrittenen Aktinomykose, insbesondere der Lungenaktinomykose.** [Therapy of advanced actinomycosis, with special reference to actinomycosis of the lungs.]—*Ärztl. Wschr.*, 10, 42, pp. 975–977, 1 fig., 1955.

Two cases of actinomycosis (*Actinomyces* Wolff-Israel) [*A. israeli*], both in males, one aged 33 and the other 47, are reported from the General Hospital, Hamburg, Germany. Both patients responded favourably to aureomycin therapy (total doses of 70 and 30 gm., respectively), and were able to resume their occupations. In the former case, involving the lungs, the cure was apparently complete, but in the latter irreversible alterations in the anatomy of the cervico-facial structure had already taken place.

2018. FISHER (A. M.) & HARVEY (J. C.). **Actinomycosis : some concepts of therapy and prognosis.**—*Postgrad. Med.*, 19, 1, pp. 32–35, 1956.

This report is based primarily on an analysis of the records in 36 cases of actinomycosis [*Actinomyces*] *bovis* [*A. israeli*] treated at the Johns Hopkins Hospital, Baltimore, Maryland, during the past 25 years. Of the 91 lesions present in these patients, 50 (54.9) per cent. involved the abdominal wall or viscera, 21 (23.1) the thoracic wall or viscera, and 12 (13.2) the cervico-facial region. The brain and retroperitoneal region were affected in three cases each and the blood stream in two. Recovery occurred in 18 of the 32 cases followed up for adequate periods.

The clinical picture is extremely variable, frequently leading to confusion with tuberculosis, other chronic infections, or malignant tumours, and necessitating repeated histological and cultural studies to establish a diagnosis.

Treatment should be based on surgical drainage and extensive excision where indicated by the nature of the lesions. The most effective medical therapy seems to be the administration for protracted periods of large doses of penicillin, sometimes combined with sulphonamides or one of the broad-spectrum antibiotics.

2019. HANF (URSULA). **Untersuchungen über die in vitro-Empfindlichkeit des *Actinomyces israeli* gegen Erythromycin, Magnamycin, Polymyxin B, Bacitracin, Neomycin, Tyrothricin, Xanthocyllin und Suprathricin.** [Studies on the *in vitro* sensitivity of *Actinomyces israeli* to erythromycin, magnamycin, polymyxin B, bacitracin, neomycin, tyrothricin, xanthocillin, and suprathricin.]—*Z. Hyg. Infektkr.*, 143, 2, pp. 127–133, 1956.

At the Hygienic Institute of the University of Cologne-Lindenthal the author determined the sensitivity of 10 strains of *Actinomyces israeli* isolated on

bouillon agar plus 1 per cent. peptone from well-defined cases of actinomycosis [cf. 2, No. 1461] to the antibiotics listed in the title. With the exception of polymyxin B [2, No. 207], which was ineffectual at dosages up to 50 units per ml., all exerted an inhibitory effect. It is suggested that a selective medium for the separation of *A. israeli* from the mixed flora always associated with actinomycosis might be developed with the aid of polymyxin B.

2020. GONZÁLEZ OCHOA (A.) & MACOTELA (E.). **Tratamiento de micosis profundas con esteroides ; inutilidad de la pregnonelona en un caso de micetoma por *Nocardia brasiliensis*.** [Treatment of deep mycoses with steroids: ineffectiveness of pregnonelone in a case of mycetoma caused by *Nocardia brasiliensis*.]—*Rev. Inst. Salubr. Enferm. trop., Méx.*, 15, 1, pp. 9–14, 1955.

A case of nocardial mycetoma [*Nocardia brasiliensis*, cf. 2, No. 218] of the upper leg in a 40-year-old man was not improved by the intramuscular administration of 300 mg. of pregnonelone daily for one month.

2021. CARLL (W. T.), FORGACS (J.), HERRING (A. S.), & MAHLANDT (B. G.). **Toxicity of *Aspergillus fumigatus* substrates to animals.**—*Vet. Med.*, 50, pp. 210–212, 1955.

In studies at Camp Detrick, Frederick, Maryland [cf. 2, Nos. 1193, 1194] olive oil suspensions of ether extracts of maize meal on which *Aspergillus fumigatus* had been cultured produced hyperaemia, oedema, and necrosis when applied topically to the skin of rabbits, a calf, and a horse. The same suspension, fed by stomach tube to a horse and a calf, produced only slight depression and lachrymation. When, however, a calf was fed, over 13 days, nearly 24 pounds of the contaminated maize suspended in water, it exhibited first lachrymation and depression and subsequently progressive toxæmia with profuse lachrymation; prostration; complete anorexia; foetid diarrhoea; and gross dehydration, and death ensued seven days after the last feed.

2022. JORDAN (F. T. W.). **Some observations on respiratory disease in Poultry.**—*Vet. Rec.*, 68, pp. 554–558, 1956. [*V.B.*, 26, No. 3748.]

In a study of the respiratory diseases affecting poultry on one farm in the course of a year two clinical forms were observed, the first a mild epidemic coryza caused by pleuropneumonia-like organisms and mainly affecting growing birds, and the second a sporadic and invariably fatal disease, mainly affecting mature birds and characterized by respiratory distress or by depression and emaciation. In the latter disease a caseous or semi-solid yellow exudate was present in the larynx, trachea and bronchi and there was often thickening of the walls of the air sacs. *Aspergillus fumigatus* was isolated from 12 of 27 samples of exudate.

2023. SLADEN (W. J. L.) & AUSTWICK (P. K. C.). **The mycoflora of wild Pink-footed Geese sampled in Iceland and Scotland, 1953.**—*Rep. Wildfowl Trust, 1953–54*, pp. 133–138 [1955].

Aspergillus fumigatus is the cause of much of the mortality among adult pink-footed geese at the Severn Wildfowl Trust, Slimbridge. In the present investigation, undertaken to discover whether the birds harboured the fungus in the wild, throat swabs were taken from a total of 294 birds, trapped at their breeding grounds in Iceland and their winter quarters in Scotland. Inoculated on to Sabouraud's dextrose agar all were negative for *A. fumigatus*, though other fungi were present in 23 per cent. of those taken in Iceland and 97 per cent. of those taken in Scotland. The predominating fungi in the latter were species of *Fusarium*, *Cephalosporium*, *Trichoderma* and dematiaceous fungi,

all of which were also isolated from the stubble on which the birds were feeding.

Details of the fungi isolated are presented in tabular form, and the techniques of sampling and culturing are discussed.

2024. BALLARINI (G.). **Aspergillus fumigatus e Rhizopus equinus in feti da aborto bovino.** [*Aspergillus fumigatus* and *Rhizopus equinus* in aborted bovine foetuses.]—*Nuova Vet.* 31, 3, pp. 78–85; 4, pp. 117–126, 3 figs., 1955.

Details are given of five cases of bovine abortion in four of which (foetuses of five to seven months) *Aspergillus fumigatus* was isolated from the fourth stomach, while in the fifth (seven months) *Rhizopus equinus* was isolated from the same organ. Since there was no evidence of nutritional deficiency, and bacteriological tests were negative for *Brucella* and other causative agents of abortion, these cases were considered to be 'of toxic origin' and to have been caused by the fungi. Two of the cows concerned had been given mouldy hay.

2025. KIRSCHSTEIN (RUTH L.) & SIDRANSKY (H.). **Mycotic endocarditis of the tricuspid valve due to *Aspergillus flavus*. Report of a case.**—*Arch. Path.*, 62, 2, pp. 103–106, 4 figs., 1956.

A man aged fifty who had undergone a splenectomy became dyspnoeic and weak on the thirteenth day after the operation, and on the sixteenth day developed peripheral vascular collapse and died. At autopsy a large, firm reddish-brown, polypoid mass was found to be firmly attached to the inferior surfaces of all three leaflets of the tricuspid valve, which was virtually destroyed. This mass consisted largely of hyphae and spores of *Aspergillus flavus*, which was also present in the lesser blood vessels of the lungs and in one of the numerous granulomas scattered throughout the lung substance. The infection is thought to have resulted from combined antibiotic treatment which was initiated 45 days before the operation to control a staphylococcal infection at the site of sternal biopsy, and continued up to and after the operation.

2026. LE NOUÈNE, ESQUIROL, & ARDILLOU. **Aspergillome bronchiectasiant multiple (3 localisations).** [Multiple bronchiectatic aspergilloma (three localizations).]—*Pr. méd.*, 64, 41, pp. 974–976, 4 figs., 1956.

A full account is given of a case of bronchiectatic aspergilloma (*Aspergillus fumigatus*) in a 48-year-old female patient in Paris [2, No. 1754], which was remarkable by reason of the three mycotic tumours revealed by radiography.

2027. BURGISSER (H.). **Mycoses nasales chez le Chevreuil.** [Nasal mycoses in Roe Deer.]—*Schweiz. Arch. Tierheilk.*, 97, 9, pp. 434–438, 4 figs., 1955.

In this paper from the cantonal Veterinary Service and the Institut Galli-Valerio, Lausanne, autopsy findings are described for five roe deer with mycotic nasal infections.

There were also lesions of the lung in three, and encephalitis in two. The pathogen was identified in one case only, an eight-month male exhibiting an ulcer at the bifurcation of the bronchi and clearly delimited nodules, two millimetres in diameter, in the lungs. Mycelium of *Aspergillus fumigatus* was abundant in the nasal cavity.

2028. STUART (E. A.) & BLANK (F.). **Aspergillosis of the ear; a report of twenty-nine cases.**—*Canad. med. Ass. J.*, 72, 5, pp. 334–337, 1955.

At the Royal Victoria Hospital, Montreal, 29 cases of aspergillosis of the ear

were observed during the period January, 1952, to June, 1954. In 11 there was no history of previous ear infection. Five occurred in patients with chronic eczema of the ears and seven occurred in patients with chronic suppurative otitis media. Three followed the use of antibiotics in the mastoid cavities and three occurred after the general use of antibiotics. Most responded favourably to the local use of cresatin, and in most large mycelial masses were removed from the ear canal. The species isolated were *Aspergillus niger* (19 times), *A. flavus* (6), *A. fumigatus* (2), *A. nidulans* (1), and *A. flavipes* (1).

2029. DEL GIUDICE (V.). **Aspergillosi polmonare in un Bovino. Studio istopatologico.** [Histopathology of pulmonary aspergillosis in an Ox.]—*Atti. Soc. ital. Sci. vet. Palermo*, 9, pp. 393–397, 1955 [English and French summaries. *V.B.*, 26, No. 2829.]

This is a report of the findings in an ox with pulmonary aspergillosis slaughtered at the Bologna abattoir. There were necrotic granulomatous foci and foci of fibrinous alveolitis. The pleura over the diseased parts was opaque, greyish, and thickened.

2030. NOBEL (T. A.) & SHAMIR (A.). [Congenital mycosis in a Lamb.]—*Refuah vet.*, 13, 1, pp. 23–24, 1956 [Hebrew, with English summary. *V.B.*, 27, No. 74.]

Granulomatous lesions containing mycelium and spores of a fungus tentatively identified as *Aspergillus fumigatus* were present in the lungs of a day-old lamb.

2031. ORDMAN (D.) & ETTER (K. G.). **The air-borne fungi in Johannesburg. A five-year survey as a basis for the study of fungus allergy in South Africa.**—*S. Afr. med. J.*, 30, 44, pp. 1054–1058, 2 graphs, 1956.

The principal genera of fungi collected in the atmosphere of Johannesburg from 1950 to 1954 were *Cladosporium*, representing 32·5 per cent. of the total, *Alternaria* (12·3), *Penicillium* and *Epicoccum* (10·1 each), *Phoma* (8·3), *Monilia* [? *Neurospora*] (16·2), *Torula* (4·7), and *Rhizopus*, yeasts, *Nigrospora*, *Stemphylium*, *Trichoderma*, and *Acrospeira* (about 1·5 each). The remaining 6·4 per cent. was constituted by 18 other genera and 41 unidentified varieties. No significant seasonal trends were observed in any of the more prevalent air-borne moulds.

2032. JOYCE (J. C.) & KNEAFSEY (D.). **Farmer's lung.**—*J. Irish med. Ass.*, 37, 220, pp. 313–315, 1955.

The authors report the clinical findings and the course of the disease in four cases of farmer's lung. The patients were farmers in County Roscommon, Eire, who contracted the disease after stall feeding in the damp autumn of 1954. Three recalled working with mouldy hay.

2033. MANDOUL (R.), FAUREL (L.), & LANTERNO (L.). **La maladie de la canne de Provence en Algérie.** [Provence Cane disease in Algeria.]—*Bull. Soc. Path. exot.*, 47, 4, pp. 572–577, 1954. [*B.A.*, 30, No. 35215.]

A disease with symptoms including congestion and oedema of the face and the nasal and ocular mucosae; lachrymation; rhinitis; inflammation and oedema of the forearm; and swelling of the scrotum occurs in workers handling mouldy Provence cane (*Arundo donax*). Of eleven fungal species cultured from the reeds *Coniosporium arundinis* [*Papularia sphaerostrana*], *Trichothecium roseum*, *Alternaria* sp., and *Fusarium* sp. were the most common and were thought to be most likely to cause the condition.

2034. BAEZ (M. M.), MOTA (A. R.), & GONZÁLEZ OCHOA (A.). **Blastomycosis Norteamericana en México.** [North American blastomycosis in Mexico.]—*Rev. Inst. Salubr. Enferm. trop., Méx.*, 14, 4, pp. 225–232, 1954.

The authors report the first case of North American blastomycosis (*Blastomyces dermatitidis*) from Mexico, in a labourer who had spent eight months in California in 1950.

2035. CHICK (E. W.), SUTLIFF (W. D.), RAKICH (JENNIE H.), & FURCOLOW (M. L.). **Epidemiological aspects of cases of blastomycosis admitted to Memphis, Tennessee, hospitals during the period 1922–1954 : a review of 86 cases.**—*Amer. J. med. Sci.*, 231, 3, pp. 253–262, 1 map, 1956.

In this epidemiological study of 86 patients hospitalized in Memphis, Tennessee, for blastomycosis [*Blastomyces dermatitidis*] over a period of 32 years, attention was paid to type of infection, mortality, and distribution according to age, sex, race, occupation, and place of residence. That most patients were male negro labourers was taken to suggest that contact with soil or soil products was the most likely source of infection.

2036. THORNELL (W. C.). **Blastomycosis of the larynx.**—*Ann. Otol., etc., St. Louis*, 64, 4, pp. 1155–1163, 4 figs., 1955.

Following a review of the literature and recent advances in the therapy of blastomycosis (*Blastomyces dermatitidis*), the author reports from the College of Medicine, Cincinnati, Ohio, a case in a 44-year-old male in which a final complication of bilateral vocal cord fixation was treated by trans-oral intralaryngeal arytenoidectomy. The operation was preceded by several years' treatment with potassium iodide.

2037. SINSKEY (R. M.) & ANDERSON (W. H.). **Miliary blastomycosis with metastatic spread to posterior uvea of both eyes.**—*Arch. Ophthalm.*, 54, 4, pp. 602–604, 1955.

From the University of California Medical Centre, Los Angeles, and the Duke University School of Medicine is reported a fatal generalized case of blastomycosis [*Blastomyces dermatitidis*] in a 39-year-old male negro, with involvement of the posterior uvea in both eyes [cf. 1, No. 693]. The histological findings in the eye lesions are described.

2038. LONDON (I. D.). **Hydroxystilbamidine treatment of North American blastomycosis.**—*Sth. med. J.*, 49, 10, pp. 1098–1102, 4 figs., 1956.

Four cases of North American blastomycosis (*Blastomycosis dermatitidis*) are reported from Montgomery, Alabama, two of the cutaneous and two of the systemic type involving the lungs, in which the disease was apparently arrested by therapy with dihydroxystilbamidine [see above, No. 1980, and next entry].

2039. KUHN (BEATRICE H.). **Stilbamidine-resistant North American blastomycosis. Blastomyces vaccine treatment.**—*Arch. Derm. Syph., Chicago*, 73, 6, pp. 556–559, 1956. [*T.D.B.*, 53, p. 1382.]

Following a brief review of the treatment of North American blastomycosis [*Blastomyces dermatitidis*] with aromatic diamidines the case is described of a woman with lesions on both legs. After the failure of stilbamidine treatment, a *Blastomyces* vaccine prepared at the Duke University School of Medicine was administered intramuscularly as a curative measure (undiluted vaccine was given at weekly intervals, with a starting dose of 0.1 ml. increasing to 1 ml. at which level it was maintained for a year, after which the interval between treatments was increased gradually to four weeks). Treatment continued up

to the time of publication, a period of two years. Improvement was revealed by negative biopsy after three months, after which there was no sign of active disease. This curative use of the vaccine stands in contrast to its normal use as a means of reducing a state of specific hypersensitivity before starting chemotherapy.

2040. BENHAM (RHODA W.). **The genus *Cryptococcus*.**—*Bact. Rev.*, 20, 3, pp. 189–200, 3 pl., 1956.

This review of recent advances in the knowledge of the genus *Cryptococcus* comprises seven parts, namely, present definition of the genus, taxonomic relationships, biological characteristics, growth characteristics, virulence for mice, nature of the capsule, and serology, concluding with a list of 35 references.

2041. ASHNER (M.) & GODINGER (D.). **An ecological study of yeasts of the genus *Cryptococcus*.**—*Harefuah, For. edn*, 49, 6, pp. 107–108, 1955. [Hebrew, with English and French summaries.]

Samples of human and rat faeces and of Jerusalem soil were examined in a study at the Hebrew University, Jerusalem, Israel, of the distribution of *Cryptococcus* spp. in nature [see next entry]. Diagnosis and definition were based on the ability of the organisms to produce starch in the capsule and in the medium, which was revealed by a brief exposure to iodine vapour. One of the soil samples yielded 10,000 to 20,000 yeasts per gm. None of the species isolated was pathogenic. Although *C. neoformans* does not differ essentially from the non-pathogenic species in its nutritional requirements, it is very rarely encountered in the soil.

2042. ASHBEL (R.) & DOLB (A.). **60 years after discovery of *Cryptococcus neoformans* (Sanfelice) Vuillemin (*Torula histolytica*).**—*Harefuah, For. edn*, 49, 6, pp. 108–113, 8 figs., 1955. [Hebrew, with English and French summaries.]

The development of knowledge concerning *Cryptococcus neoformans* during the past 60 years is reviewed, information on its biological properties and distribution in nature is summarized, and cases of the disease are described from all parts of the world, including four recent ones from Israel [see preceding entry].

In laboratory experiments on golden hamsters [*Mesocricetus auratus*] the course of the disease was markedly influenced by the route of inoculation. Animals inoculated intraperitoneally or subcutaneously survived for 40 to 100 days as against only 17 to 30 for the intracerebral route. The development of pseudo-tumours consisting mainly of yeast aggregates was a characteristic result of inoculation. The viscera of larvae of the fly *Calliphora*, breeding in pseudo-tumours of an infected hamster, were found to contain the fungus, which was not, however, transmitted to the pupae. The urine and other secretions proved to be a potential source of infection.

C. neoformans remained viable for 22 months on a dried agar slant. Growth was promoted by the presence of penicillin.

2043. MONNET (P.) & BLANC (P. F.). **Les cryptococcoses humaines.** [Human cryptococcoses.]—*Sem. Hôp., Paris*, 31, 72, pp. 3851–3862, 1955.

This is a fully documented analytical review and discussion of 92 contributions to the literature on cryptococcosis (*Cryptococcus neoformans*).

2044. SIRVÉN (R. H.), BONFIGLIOLI (H.), HOJMAN (D.), LERNER (A.), & MACCHI (A.). **Criptococosis y enfermedad de Hodgkin.** [Cryptococcosis and Hodgkin's disease.]—*Prensa méd. argent.*, 42, 29, pp. 2192–2201, 5 figs., 1955.

Following a survey of cryptococcosis (*Cryptococcus neoformans*), based on

25 contributions to the literature, the authors present a detailed report of a fatal case associated with Hodgkin's disease [2, Nos. 1792, 1794] in a 21-year-old male patient at a Buenos Aires hospital. The cryptococcal meningo-encephalitis developed as a sequel to the administration of actinomycin (total of 10,000 units in 25 days).

2045. WU-FEI (C.). **Cryptococcosis: report of a case.**—*Chin. med. J.*, 74, 4, pp. 374–384, 2 figs., 1956.

A fatal case of pulmonary cryptococcosis (*Cryptococcus neoformans*) with possible meningeal involvement in a 41-year-old male is reported from the First Municipal Tuberculosis Hospital, Tientsin, and compared with seven other cases occurring in China which were described (in Chinese) in *Nat. med. J. China*, 39, pp. 773–779, 1953, and *Chin. J. intern. Med.*, 3, pp. 119–121, 511–515, 1955.

It is added in a footnote that two further cases of the disease were brought to the author's notice after completion of this paper.

2046. HAMMER (D.) & ENGLERT (H. K.). **Torulopsisendocarditis bei einem Bullen.** [Endocarditis in a Bull caused by *Torulopsis*.]—*Tierärztl. Umsch.*, 11, 2, pp. 47–51, 6 figs., 1956.

The authors describe in detail the pathology of the heart and kidneys in a young bull slaughtered at 18 months because of progressive cardiac weakness following massive antibiotic treatment of a syndrome of rickets, arthritis, and tendo-vaginitis, increased rate of breathing and pulse rate, and severe coughing. There was severe endocarditis, especially affecting the tricuspid valve, and subacute glomerular nephritis was also apparent. *Cryptococcus neoformans* was isolated from the heart tissue.

2047. SEELIGER (H. P. R.). **Use of a urease test for the screening and identification of cryptococci.**—*J. Bact.*, 72, 2, pp. 127–131, 1956.

In studies at the Communicable Disease Center, Chamblee, Georgia, and at the Institute of Hygiene, Friedrich Wilhelms University, Bonn, all examined strains of *Cryptococcus*, *Rhodotorula*, *Pullularia*, *Sporobolomyces*, *Candida humicola*, *Trichosporon cutaneum*, and *T. pullulans* hydrolysed urea when inoculated at the surface of Christensen's urea agar (*J. Bact.* 52, pp. 461–466). *Debaryomyces klockeri* and related species, *Candida zeylanoides*, *Lipomyces lipoferus*, and several species of *Trichosporon* did not hydrolyse urea. This test permits the rapid routine separation of cryptococci from other non-fermenting 'yeasts'. Possible applications of the test in taxonomic work are discussed.

2048. HOOFT (C.), PINTELON (L.), & CALLENS (J.). **Meningite à *Cryptococcus*.** [Meningitis caused by *Cryptococcus*.]—*Acta paediat. belg.*, 9, 4, pp. 152–168, 3 figs., 1 graph, 1955. [Flemish and English summaries.]

From the Pediatric Clinic of the University of Ghent, Belgium, the authors report a case of meningitis caused by a species of *Cryptococcus* which could not be certainly identified as *C. histolytica* [*C. neoformans*], in a 13-year-old boy. For nine months the patient was unsuccessfully treated for tubercular meningitis, but on the detection of the fungus in the cerebrospinal fluid a course of oral administration of elkosin [1, Nos. 861, 2239] was instituted, which resulted in an apparently complete recovery.

2049. SHERMAN (I. C.) & BOSHERS (L. D.). **Some fungus infections of the central nervous system; experience with recent treatments.**—*Bol. Assoc. Med. P.R.*, 48, 6, pp. 225–238, 12 figs., 1956.

This paper includes an account of three cases of cryptococcosis [*Crypto-*

coccus neoformans] of the central nervous system, in two of which cycloheximide [actidione] did not affect the fatal course of the disease, while in the third, which had been clinically static with moderate symptoms for two years, the authors attribute to the drug the rapid and fatal aggravation of the condition which followed its use.

2050. BONMATI (J.), ROGERS (J. V.), & HOPKINS (W. A.). **Pulmonary cryptococcosis.**—*Radiology*, 66, 2, pp. 188–194, 8 figs., 1956. [Spanish summary.]

From the Emory University School of Medicine, Atlanta, Georgia, the authors report seven new cases (four fatal) of pulmonary cryptococcosis (*Cryptococcus neoformans*), bringing the total recorded up to 1952 in English literature to at least 82.

The radiographic findings fall into three groups, viz. (1) pseudotumorous lesions, (2) disseminated, small, nodular lesions, and (3) infiltrative lesions of variable aspect. Diffuse involvement of one or both lungs is most commonly found, the lower lobes being about twice as often affected as the upper. Surgical excision is the only known effective treatment for localized pulmonary cryptococcosis.

2051. BINDER (L.), CSILLAG (A.), & TÓTH (G.). **Diffuse infiltration of the lungs associated with *Cryptococcus luteolus*.**—*Lancet*, 270, 6931, pp. 1043–1045, 2 figs., 1956. [*B.H.*, 31, p. 1009.]

A Hungarian girl was admitted to hospital with symptoms of pulmonary disease and fever. Radiological examination revealed numerous disseminated soft and rather ill-defined nodular shadows of various sizes in both lungs, chiefly in the middle zones. The hilar shadows were not increased and the mediastinum was clear. Sensitivity tests and other examinations for tuberculosis were negative.

Three samples of bronchial secretion all contained a yeast, which was identified as *Cryptococcus luteolus*. Under administration of penicillin, streptomycin, and isoniazid and supportive vitamin and tonic treatment, the patient showed early symptomatic improvement, though the radiological picture remained unchanged for some time longer and was apparently unaffected by the administration of paraben. The patient was released from hospital after four months, and after a further five months the X-ray picture of the lungs had cleared almost completely.

2052. BUREAU (Y.), BARRIÈRE (H.), & TRICHEREAU (R.). **La torulose cutanée.** [Cutaneous torulosis.]—*Ann. Derm. Syph., Paris*, 82, 5, pp. 484–509, 11 figs., 1955.

A case of cutaneous torulosis (*Torula histolytica*) [*Cryptococcus neoformans*], localized on the right hand of a 57-year-old farmer, is reported from the School of Medicine, Nantes. The budding, nodular lesions were completely cured by a 25-day course of distilbene (one tablet of 25 mg. daily), but the patient succumbed about a year after the onset of infection to acute anaemia, which was a marked feature of the illness from the beginning.

In this connexion observations on a number of other cases involving the skin are summarized from the relevant literature.

2053. EMMONS (C. W.). **Silver in the treatment of experimental cryptococcosis.**—*Antibiot. & Chemother.*, 6, 10, pp. 598–602, 2 graphs, 1956.

At the National Institutes of Health, Bethesda, Maryland, silver salts, administered by intraperitoneal injection, extended by two to five times the survival period of mice experimentally inoculated by the intravenous route

with *Cryptococcus neoformans* at a dosage level of 2.5 by 10^6 cells per mouse, which killed all the controls, usually by the 20th day.

2054. JONES (D. L.), HUBBLE (R. H.), & BRYNE (H. J.). **Antimicrobial action of betaine derivatives.**—*Antibiot. & Chemother.*, 6, 6, pp. 391–394, 1956.

Betaine tetradecyl amide chloride inhibited the growth of *Cryptococcus neoformans* *in vitro* at 1 μ g. per l. Experimental infection in mice, however, was not checked by intravenous or intraperitoneal injection at a dosage of 15 μ g. per gm., though the drug was well tolerated. Despite this failure the authors consider that the drug deserves trial in human cases of the disease where a fatal outcome would otherwise be certain.

Betaine hexdecyl amide chloride produced rapid initial healing in four cases of tinea capitis (*Microsporum audouinii*), but regression of healing set in after a month.

2055. DORDEVIĆ (Z.). **Cultivation of *Cryptococcus farciminosus*.**—*Vet. Glasn.*, 10, pp. 279–282, 1956. [*V.B.*, 27, No. 716.]

The author reports cultivation of *Cryptococcus farciminosus* [*Histoplasma farciminosum*] on an agar-serum medium, a potato medium and a two per cent. peptone water-glucose medium. Before inoculation the media were treated with 50 units per ml. of crystallized penicillin. It was important to maintain a pH of 7.2 to 7.4.

2056. CIFERRI (R.), CORDEIRO DE AZEVEDO (P.), CAMPOS (S.), & CARNEIRO (L. S.). **—Taxonomy of Jorge Lobo's disease fungus.**—Publication No. 53, Institute of Mycology, Recife, Pernambuco, Brazil, 21 pp., 5 pl., 1956.

The authors report a full taxonomic study of *Glenosporella lobo* [cf. 1, Nos. 894, 911], carried out on the original strain (N. 525 F.M.S.P. supplied by Professor da Silva Lacaz, São Paulo) isolated in 1931 by Lobo from a patient in Recife, Brazil, whom he subsequently kept under observation until 1953. They tabulate clinical and cultural characteristics distinguishing it from *Paracoccidioides brasiliensis*, and propose a new monotypic genus *Loboa* for *L. lobo*.

2057. BORELLI (D.). **Ventajas y peligros del examen directo en fresco para el diagnóstico de la paracoccidioidomicosis.** [Advantages and dangers in direct examination in the diagnosis of paracoccidioidomycosis.]—*Gac. méd. Caracas*, 63, 7–11, pp. 357–358, 1955.

The author states that in many cases a diagnosis of paracoccidioidomycosis [*Paracoccidioides brasiliensis*] can be arrived at simply by the microscopical examination of a saline preparation of exudate or biopsy material.

2058. HERRERA (J. M.). **Paracoccidioidosis brasiliense. Estudio del primer caso observado en Panamá de blastomicosis sudamericana en su forma cutánea queloidéa o enfermedad de Lobo y propuesta de una variante técnica para la impregnación argéntica del parásito.** [Brazilian paracoccidioidosis. Study of the first case of South American blastomycosis observed in Panama in its cutaneous keloid form or Lobo's disease, and proposal of a technical variation for the silver impregnation of the parasite.]—*Arch. méd. panam.*, 4, 4, pp. 209–219, 10 figs., 1956. [English and German summaries.]

From the Hospital José D. de Obaldía, David, Chiriquí, Panama, the author describes the histology of a slow-growing tumour on the left leg of a 37-year-old male patient, and gives a full description of a method of staining the tissues with ammoniacal silver carbonate for studies on the morphology of the

causal organism, *Paracoccidioides brasiliensis*, reported for the first time from the Republic.

2059. BALDO (J. I.). **Paracoccidioidomycosis pulmonar.** [Pulmonary paracoccidioidomycosis.]—*Rev. Sanid. Asist. soc.* 18, 1-2, pp. 163-176, 6 figs., 1953.

This is a general account of paracoccidioidomycosis [*Paracoccidioides brasiliensis*] of the lung in Venezuela, with a description of the epidemiological, pathological and clinical features of 23 cases. Pulmonary involvement, at one time considered to be relatively uncommon in this disease, is now known to occur so frequently that many regard the lung as a primary site of infection by inhalation. Attention is drawn to cases where autopsy has revealed extensive involvement of the deep groups of lymph nodes, particularly the mesenteric nodes, in cases which from clinical findings were believed to be instances of merely focalized disease. Lesions of the mouth, larynx and pharynx, commonly regarded as primary sites of the disease, were not present in some cases proved at autopsy. The author discusses the relationship of pulmonary and oro-pharyngeal lesions at some length, and makes a plea for more complete clinical investigations of the disease.

2060. LACAZ (C. DA S.), STERMAN (L.), MONTEIRO (E. V. L.), & PINTO (D. O.). **Blastomicose queloideana. Comentários sobre novo caso.** [A new case of keloid blastomycosis.]—*Rev. Hosp. Clin., S. Paulo*, 10, 4, pp. 254-264, 5 figs., 1955. [*T.D.B.*, 53, p. 1383.]

This is a report of keloid blastomycosis (*Paracoccidioides lobo*) [combination published by Almeida and Lacaz in *Ann. Fac. Med., S. Paulo*, 24, 16, 1949]) affecting a 23-year-old male resident in Manaus, Amazonas, Brazil.

Biopsy of a cutaneous lesion revealed infiltration, consisting mainly of S.R.E. cells, and numerous organisms staining well by the Hotchkiss-McManus technique. Chain forms were abundant in the tissue, but peripheral budding was not observed. Culture and inoculation of guinea-pigs and hamsters gave negative results, as did the complement fixation test with a polysaccharide prepared from *P. brasiliensis*. The organism grew well on chick chorio-allantoic tissue.

2061. O'LEARY (D.) & CURRY (F. J.). **Coccidioidomycosis. A review and presentation of 100 consecutively hospitalized patients.**—*Amer. Rev. Tuberc.*, 73, 4, pp. 501-518, 11 figs., 1956.

Of the 100 patients with coccidioidomycosis (*Coccidioides immitis*) admitted to the Fitzsimons Army Hospital, Denver, Colorado, from October, 1948, to March, 1955, 87 were males. The age group ranged from 18 to 52 years, with 64 in the twenties. Three out of four cases of disseminated infection which terminated fatally were in negroes. According to Schwarz and Muth (*Amer. J. med. Sci.*, 221, p. 89, 1951), the incidence of dissemination in negroes is 14 times that of whites, while their death rate is 20 times as high.

Roentgenograms revealed upper and lower lobe lesions in 67 and 20 cases, respectively. The coccidioidin skin test was positive in 71 out of 96 patients, including 40 out of 55 of those with cavitory involvement. The results of serological tests were available for 70 cases in the series; of the 27 with positive complement-fixation reactions, 15 were cavitory, four infiltrative, three disseminated, two nodular, and one each hydropneumothorax, pneumonic, and hilar lymphadenopathy.

C. immitis was isolated from 41 out of 91 patients, 35 times from the sputum, bronchial washings, or gastric aspirates. Spherules were demonstrated in the entire 62 resected specimens of the series and mycelia in 34, 25 of which represented cavities.

2062. FRIEDMAN (LORRAINE), SMITH (C. E.), PAPPAGIANIS (D.), & BERMAN (R. J.). **Survival of *Coccidioides immitis* under controlled conditions of temperature and humidity.**—*Amer. J. publ. Hlth*, 46, 10, pp. 1317–1324, 1 graph, 1956.

Further evidence of the successful adaptation of *Coccidioides immitis* to an arid habitat [2, No. 66 et passim] is reported from the Naval Biological Laboratory and the School of Public Health, University of California, Berkeley [cf. next entry], where the spores survived for six months in many environments, with temperatures ranging from -15° to 37° C. and relative humidities from 10 to 95 per cent.

2063. FRIEDMAN (LORRAINE) & SMITH (C. E.). **Vaccination of Mice against *Coccidioides immitis*.**—*Amer. Rev. Tuberc.*, 74 (1), 2, pp. 245–248, 1 graph, 1956. [Spanish and French summaries.]

It is reported from the Naval Biological Laboratory and the School of Public Health, University of California, Berkeley [cf. preceding entry], that white mice vaccinated subcutaneously with killed spores of *Coccidioides immitis* [2, Nos. 1814–1815] developed an increase of resistance to challenge by viable spores of the fungus, as demonstrated by the survival of 95 to 100 per cent. as compared with 20 per cent. of the unprotected controls. It was revealed at autopsy, however, that nearly all the survivors were infected.

2064. BAKER (P. L.). **Pregnancy complicated by coccidioidomycosis : report of two cases.**—*Amer. J. Obstet. Gynec.*, 70, 5, pp. 1033–1038, 1955.

A condensed general discussion of coccidioidomycosis (*Coccidioides immitis*), with special reference to its occurrence during pregnancy, is followed by reports of two cases (out of 24,700 deliveries in 11 years) from the Dependents' Service, U.S. Naval Hospital, Oakland, California. One patient succumbed to meningitis in the final trimester, while spontaneous abortion followed pulmonary infection at an early stage in the other case.

2065. CHRISTIAN (J. R.), SARRE (S. G.), PEERS (J. H.), & SALAZAR (E.). **Pulmonary coccidioidomycosis in a twenty-one-day-old Infant. Report of a case and review of the literature.**—*J. Dis. Child.*, 92, 1, pp. 66–74, 4 figs., 1956.

A review of 242 articles on coccidioidomycosis (*Coccidioides immitis*), containing reports on 561 cases, revealed 99 in the age group up to 16 years the majority (83) from California, with 51 Mexicans or negroes. Boys outnumbered girls (57 to 37) in the pre-school age group. Osteomyelitis is the commonest of a variety of clinical pictures reported. The average mortality is 33 per cent., decreasing with age. A fatal case of the disease in a three-weeks-old male infant [2, No. 1239] is described from the Mercy Hospital, Chicago. Diagnosis was made at autopsy and positive findings were limited to multiple nodules in the lungs. The mother had a healed bone lesion of coccidioidomycotic origin.

2066. TRIMBLE (J. R.) & DOUCETTE (JEANNE). **Primary cutaneous coccidioidomycosis. Report of a case of a laboratory infection.**—*Arch. Derm., Syph.*, Chicago, 74, 4, pp. 405–410, 3 figs., 1 graph, 1956. [*T.D.B.*, 54, p. 223.]

A case is reported of primary cutaneous coccidioidomycosis [*Coccidioides immitis*] resulting from an accidental laboratory infection.

2067. DAS (A. K.), CHATTERJEE (M. K.), & DEB SIKDAR (B. M.). **A case of coccidiomycosis in India.**—*Calcutta med. J.*, 53, 8, pp. 272–276, 4 figs., 1956. [*T.D.B.*, 54, p. 85.]

A 29-year-old woman was admitted to hospital with suppurating and dis-

charging granulomatous lesions of the left foot, both thighs, chest, back and abdomen. Diagnosis of coccidioidomycosis [*Coccidioides immitis*] was based on the discovery of 'large round bodies about four to five times the size of a pus cell' which 'had a double contour wall and enclosed smaller-shaped bodies inside'.

The patient can no longer be traced, and the diagnosis remains unconfirmed, but if it was correct this is the first reported case of autochthonous coccidioidomycosis in India.

2068. AJELLO (L.), REED (R. E.), MADDY (K. T.), BUDURIN (A. A.), & MOORE (JANE C.). **Ecological and epizootiological studies on canine coccidioidomycosis.**—*J. Amer. vet. med. Ass.*, 129, 10, pp. 485–490, 8 figs., 1 diag., 1956.

An epizootic of coccidioidomycosis (*Coccidioides immitis*), involving five pure-bred collie dogs brought from Michigan to the vicinity of Tucson, Arizona [2, No. 1824], is fully described. The fungus was isolated from a soil sample collected near a rodent burrow in the yard where exercise was taken. The ecological features of the area are summarized and discussed in relation to factors determining the endemiology of the pathogen.

2069. LEVAN (N. E.) & BURGER (C. H.). **Coccidioidomycosis in Dogs. A report of three cases.**—*Calif. Med.*, 83, 5, pp. 379–380, 1955.

The three cases of coccidioidomycosis (*Coccidioides immitis*) in dogs herein reported from the University of Southern California School of Medicine, Bakersfield, demonstrated the existence of a parallelism between canine and human manifestations of the disease, including the self-limiting 'valley-fever' syndrome.

2070. WAYNE (L. G.) & JUAREZ (W. J.). **Isolation of *Coccidioides immitis* from spinal fluid by molecular filter membrane technique.**—*Amer. J. clin. Path.*, 25, 10, pp. 1209–1211, 1955. [*B.A.*, 30, No. 20035.]

In two cases of suspected coccidioidal meningitis at the Veterans' Administration Hospital, San Fernando, California, cultures of *Coccidioides immitis* were obtained by filtering spinal fluid through molecular filters, which were then cultured on brain-heart infusion agar. The organism was not obtained from the spinal fluid by the standard technique.

2071. JELLISON (W. L.). **Haplomycosis in Sweden.**—*Nord. VetMed.*, 8, pp. 504–506, 1 fig., 1956. [German and Swedish summaries.]

From the National Institutes of Health, Rocky Mountain Laboratory, Hamilton, Montana, the author reports that one out of 31 specimens of the lungs of a murine rodent, *Apodemus flavicollis*, collected in the province of Gävleborg, Sweden, contained two spherules of *Haplosporangium parvum* measuring 203μ in diameter. This is believed to be the first record of the disease for the continent of Europe [cf. 2, No. 1013].

2072. BAKERSPIGEL (A.). **Haplosporangium in Saskatchewan Rodents.**—*Mycologia*, 48, 4, pp. 568–572, 2 figs., 1956.

During a survey carried out in Saskatchewan in 1955 with the purpose of isolating *Haplosporangium* and other fungi from the rodent population, the lungs of two white-footed mice (*Peromyscus maniculatus borealis*), trapped in June near Saskatoon, were found to be heavily infected with the spherules of *Haplosporangium*, 79.2 to 198μ in diameter. The walls were 11 to 13.2μ thick. This is the first report of *Haplosporangium* in rodents in Saskatchewan.

2073. **Proceedings of the conference on histoplasmosis, 1952.**—Public Health Monograph No. 39, U.S. Department of Health, Education, and Welfare, 1956. Price U.S. \$2.0.

In the course of this conference at Excelsior Springs, Missouri, U.S.A., from the 18th to the 20th November, 1952, five sessions were held.

At the first session, covering the clinical, pathological and epidemiological aspects of the disease, papers were presented by M. L. FURCOLOW, 'The clinical diagnosis of histoplasmosis'; I. SNAPPER & S. S. SCHNEIERSON, 'The fungistatic action of stilbamidine and 2-hydroxystilbamidine against *Histoplasma capsulatum* as compared to *Blastomyces dermatitidis*'; J. SCHWARZ, 'General aspects of the pathology of histoplasmosis'; H. E. MELENEY, 'Problems in the histological diagnosis of histoplasmosis'; H. E. PINKERTON, 'Differential pathology of histoplasmosis'; A. B. SABIN, 'An epidemic of miliary granulomatous pneumonitis caused by *Histoplasma*'; C. G. LOOSLI, 'Some epidemiological and clinical aspects of pulmonary histoplasmosis in a farm family'; A. E. FELLER, A. D. LANGMUIR, & J. H. DINGLE, 'An outbreak of an unusual form of pneumonia at Camp Gruber, Oklahoma. A review of the outbreak and followup studies'; H. W. LARSH & M. L. FURCOLOW, 'Followup of the Camp Gruber epidemic'; J. T. GRAYSTON & M. L. FURCOLOW, 'Epidemics of histoplasmosis'; S. B. SALVIN, 'Discussion of serology of histoplasmosis'; M. J. WILLIS & M. L. FURCOLOW, 'Laboratory infections with *Histoplasma capsulatum*'.

At the second session, dealing with the mycological aspects of the disease, papers were delivered by L. AJELLO, '*Histoplasma capsulatum*, a review of its historical background'; S. B. SALVIN, 'Growth of *Histoplasma capsulatum* in liquid medium'; M. A. GORDON, 'The problem of a selective isolation medium for *Histoplasma capsulatum*'; G. C. COZAD & M. L. FURCOLOW, 'Laboratory studies of *Histoplasma capsulatum*. II. Size of spores'; H. W. LARSH, AGNES HINTON, & M. L. FURCOLOW, 'III. Efficiency of the flotation method in isolation of *Histoplasma capsulatum* from soil'; A. L. HELMBRIGHT & H. W. LARSH, 'The size of the spores of *Histoplasma capsulatum*'; C. W. EMMONS, 'Isolation of *Histoplasma* by animal inoculation'; H. W. LARSH, G. C. COZAD, AGNES HINTON, & M. L. FURCOLOW, 'The mouse as an aid in the isolation of *Histoplasma capsulatum* and the effect of adjuvants'; L. AJELLO & L. C. RUNYON, 'Infection of mice with single spores of *Histoplasma capsulatum*'; J. T. GRAYSTON, P. L. ALTMAN, & G. C. COZAD, 'Experimental histoplasmosis in mice. A preliminary report'; C. W. EMMONS, 'Ascospin in the treatment of experimental histoplasmosis in mice'; S. B. SALVIN, 'Immunization of mice against *Histoplasma capsulatum*'; H. W. LARSH, AGNES HINTON, & G. C. COZAD, 'Cultivation of *Histoplasma capsulatum* in the chick embryo'.

The third session covered serological diagnosis, and comprised papers by J. H. SCHUBERT, 'Evaluation of histoplasmin antigens for the complement fixation test'; S. SASLAW, 'The collodion agglutination test'; S. B. SALVIN & M. L. FURCOLOW, 'The precipitin test in human histoplasmosis'; J. T. GRAYSTON, 'A study of the complement fixation reaction in histoplasmosis, employing whole yeast-phase cells as antigen'; CHARLOTTE C. CAMPBELL, 'Use of yeast-phase antigens in a complement fixation test for histoplasmosis. IV. Results with ground yeast-phase antigens in serial specimens of serums from thirty-seven patients'; CHARLOTTE C. CAMPBELL, 'Cross reactions of mycotic antigens'; M. L. FURCOLOW, 'Comparative serologic study: Introduction'; D. J. TENENBERG, 'Histoplasmin and whole yeast-phase *Histoplasma capsulatum* as antigen in complement fixation tests on histoplasmosis'; S. SASLAW, 'Collodion agglutination test and complement fixation test with ground yeast-phase antigen'; S. B. SALVIN, 'Precipitin and complement fixa-

tion tests with whole yeast-phase antigen'; D. S. MARTIN, 'Preliminary experiments on the separation of antiprotein and anticarbohydrate antibodies in North American blastomycosis'.

The fourth session dealt with the skin test as an epidemiological tool. Papers were presented by C. E. SMITH, 'Analogy of coccidioidin and histoplasmin sensitivity'; N. E. MANOS, 'Histoplasmin sensitivity conversion rates'; L. D. ZEIDBERG, 'The microdistribution of histoplasmin sensitivity in an endemic area'; W. G. BEADENKOPF, J. T. GRAYSTON, L. J. SAVAGE, J. M. WARD, C. G. LOOSLI, & C. HALL, 'Histoplasmin and tuberculin sensitivity among Illinois residents'; J. T. GRAYSTON, M. L. FURCOLOW, & R. HEEREN, 'Geographic distribution of histoplasmin reactors among school-age children in Jackson County, Iowa'; R. W. MENGES, 'Histoplasmin sensitivity in animals'; C. F. T. MATTERN, J. A. BELL, B. J. OLSON, C. W. EMMONS, & E. P. POWELL, 'Continued observations on histoplasmin sensitivity and calcified pulmonary lesions in a rural community'; W. G. WORKMAN & G. A. HOTTLE, 'Standardization of histoplasmin'; A. B. HILLEGAS, 'Availability of standardized histoplasmin'.

The fifth session covered natural reservoirs of the fungus, and comprised papers by C. W. EMMONS, 'Isolation of *Histoplasma capsulatum* from soil'; L. D. ZEIDBERG, 'Soil Studies'; H. W. LARSH & AGNES HINTON, 'Soil studies'; C. RITTER & R. L. CULP, 'Studies of *Histoplasma capsulatum* experimentally introduced into tap-water'; W. B. COOKE & P. W. KABLER, 'The survival of *Histoplasma capsulatum* in water'; M. A. GORDON, 'Water as a possible natural reservoir of *Histoplasma capsulatum*'; D. A. ROWLEY, 'Pathological studies of histoplasmosis. Preliminary report on fifty cats and fifty dogs from Loudoun County, Virginia'; C. W. EMMONS, 'Histoplasmosis in animals'; C. R. COLE, R. L. FARRELL, D. M. CHAMBERLIN, J. A. PRIOR, & S. SASLAW, 'Animal histoplasmosis'; R. W. MENGES, M. L. FURCOLOW, & AGNES HINTON, 'The role of animals in the epidemiology of histoplasmosis'; M. L. FURCOLOW & W. H. HORR, 'Air and water in the natural history of *Histoplasma capsulatum*'.

At the final session C. E. SMITH, H. W. LARSH, A. B. SABIN, C. G. LOOSLI, & K. HABEL, chairmen of the first five sessions, respectively, reviewed the work covered.

An extensive bibliography is appended to this valuable report.

2074. LINDEBOOM (G. A.), HOOGENDIJK (J. L.), & HOOGENDIJK-VAN DORT (F. E.). **Histoplasmosis in Java.**—*Docum. Med. geogr. trop.*, 8, 4, pp. 327–334, 7 figs., 1956.

A case of histoplasmosis (*Histoplasma capsulatum*), contracted in Java [2, No. 1839] by a 44-year-old Dutchman, is reported from Amsterdam, where the patient succumbed in the Juliana Hospital six weeks after the diagnosis was established. Symptoms included persistent fever, anaemia, splenomegaly, and excrescences in the mouth from which the fungus was cultured. Inoculation experiments on four mice and a guinea-pig gave positive results.

2075. LARSH (H. W.), HINTON (AGNES), & COZAD (G. C.). **Natural reservoir of *Histoplasma capsulatum*.**—*Amer. J. Hyg.*, 63, 1, pp. 18–27, 1956. [*B.A.*, 30, No. 20027.]

At the University of Oklahoma 1,024 soil samples from 17 states were examined by mouse inoculation for the presence of *Histoplasma capsulatum*. Forty-seven, all from sheltered locations, were positive. Of the samples from chicken-houses, those from disused houses were more often positive than those from houses in current use.

2076. FLOCH (H.) & ANDRÉ (J.). **Recherches sur l'histoplasmosse.**—[Research on histoplasmosis.]—*Rev. bras. Malariol.*, 7, 4, pp. 391–397, 1956.

Of 160 soil samples from closed chicken runs, examined by mouse or rat inoculation at the Institut Pasteur, Cayenne, French Guinea, seven were positive for *Histoplasma capsulatum* [cf. 2, No. 322].

2077. WAYS (P.), BRYANT (J.), & GUICHERIT (I. D.). **Histoplasmosis sensitivity among the Bush Negroes of Surinam.**—*Docum. Med. geogr. trop.*, 8, 4, pp. 383–391, 1 graph, 1956.

Of 180 residents of the bush negro village of Langatabbetje, Surinam, tested for cutaneous sensitivity to histoplasmin, 62 (34.8 per cent.) reacted positively. Sensitivity rose sharply in the 11–15 year age group and slowly thereafter.

2078. SMITH (R. T.). **Histoplasmosis ; a review with an epidemiological and clinical study of an outbreak occurring in Minnesota.**—*Journal-Lancet*, 75, 3, pp. 83–100, 1955.

After a detailed historical review of the disease, with 98 references, the author described an outbreak involving eight members of a family in Wright County, Minnesota, in whom symptoms ranged from the mild pulmonary to the disseminated fatal type. A subsequent survey of histoplasmin sensitivity in the county revealed a high proportion of reactors in the South-east, and in a number of cases several members of a household were positive while all other households in the neighbourhood were negative. The author considers these findings to indicate that the disease is contracted from limited foci offering optimal conditions for the saprophytic growth of the fungus.

2079. PEABODY (J. W.). **Histoplasmosis. Unraveling the Panamanian puzzle.**—*New Engl. J. Med.*, 255, 9, pp. 408–413, 3 figs., 1956.

A case of disseminated histoplasmosis (*Histoplasma capsulatum*) in a 29-year-old naval recruit is reported from the Naval Hospital, Bethesda, Maryland. He had been stationed in Panama [cf. 2, Nos. 1253, 1254] for 20 months before admission.

2080. AUDEBAUD (G.), MERVEILLE (P.), LALUQUE (P.), & DEPOUX (R.). **Sur le premier cas d'histoplasmosse en A.E.F.** [The first case of histoplasmosis in French Equatorial Africa. *Bull. Soc. Path. exot.*, 47, 6, pp. 803–808, 3 figs., 1954.

This is a report from the Pasteur Institute Brazzaville, of the first case of histoplasmosis (*Histoplasma duboisii*) in French Equatorial Africa [cf. 2, No. 1279 and next entry]. The patient was a male negro with superficial abscesses from which the organism was isolated.

2081. GANZIN (M.), DEPOUX (R.), MERVEILLE (P.), & AUDEBAUD (G.). **Contribution à l'étude de l'histoplasmosse africaine.** [A contribution to the study of African histoplasmosis.]—*Bull. Soc. Path. exot.*, 48, 3, pp. 303–308, 1 fig., 1955.

At the Pasteur Institute, Brazzaville, serum from the patient of Audebaud *et al.* [see preceding entry] and from 13 apparently healthy subjects who had reacted positively to the histoplasmin test was examined by electrophoresis and by the complement fixation reaction. Pus from the first mentioned was also examined by inoculation into mice and guinea-pigs by various routes. From the results and from other observations they concluded that the reticulo-endothelial system is affected in infections of the African type and that it is therefore unjustifiable to draw a hard and fast division between

African type infection on the one hand, characterized by peripheral abscesses, and American-type infection on the other, characterized by visceral lesions. This view is strengthened by the extensive lesions of the liver and spleen produced in the mice by the strain of *Histoplasma duboisii* under study.

2082. SOTGIU (G.) & CORBELLI (G.). **Micosi rare. Osservazione dei primi due casi di istoplasmosi in Italia e di un caso di coccidioidomicosis.** [Rare mycoses. Observation of the first two cases of histoplasmosis in Italy and a case of coccidioidomycosis.]—*Boll. Sci. med.*, 127, 2, pp. 85–92, 4 figs., 1955.

Details are given of the first two cases of human histoplasmosis recorded in Italy. The first occurred in 1950 and was a fatal generalized infection of a male aged 31 years. The second was a pulmonary infection of a 66-year-old man.

As neither patient had ever been out of Italy or been in contact with material likely to have come from an infected area, it was concluded that both cases were autochthonous. Also reported is a case of coccidioidomycosis [*Coccidioides immitis*] in a male aged 38 years whose sputum showed the presence of the organism. Some years before this patient had worked as a lorry-driver handling sacks of grain of North American origin, and attempts are to be made to ascertain whether this grain was the source of the infection. This is stated to be the fourth case of coccidioidomycosis recorded in Italy.

2083. SYMMERS (W. ST. C.). **Histoplasmosis contracted in Britain. A case of histoplasmic lymphadenitis following clinical recovery from Sarcoidosis.**—*Brit. med. J.*, 1956, 4996, pp. 786–790, 3 figs., 1956. [*B.H.*, 32, p. 36.]

The author reports the first authentic case of histoplasmosis [*Histoplasma capsulatum*] contracted in Great Britain [2, No. 1556], the patient being an adult male who had never lived outside the British Isles.

2084. LACAZ (C. DA S.), LUISI (A.), DEL NEGRO (G.), & CASTRO (R. M.). **Histoplasmoze na infância, Comentários sôbre um caso, Revisão da literatura nacional. Novos dados sôbre a histoplasmina em nosso meio.** [Histoplasmosis in Children. Case report. Review of the national literature. New facts about histoplasmosis in our midst.]—*Rev. paul. Med.*, 47, 5, pp. 495–509, 2 figs., 1 map, 1955. [English summary.]

A case of histoplasmosis (*Histoplasma capsulatum*) in a 23-month-old male infant is reported from Bahia, bringing the total for Brazil [1, Nos. 735, 938, 1159, 2438] to ten. Diagnosis was established at autopsy, which revealed involvement of the liver, spleen, lymph nodes, lungs, brain, and possibly the small intestine.

The dependability of the histoplasmin test is questioned, since it is known that patients with South American blastomycosis (*Paracoccidioides brasiliensis*) may react positively to the antigen; among the authors' cases six of 20 did so. Of 282 persons selected at random (including 25 with deep mycoses), 15.3 per cent. were positive reactors.

The paper concludes with a brief survey of the literature on histoplasmosis in animals. Tests with histoplasmin on 56 horses and 35 sucking pigs in Bahia gave negative results.

2085. METZLER (D. F.), RITTER (CASSANDRA), & CULP (R. L.). **Effect of standard water purification processes on the removal of *Histoplasma capsulatum* from water.**—*Amer. J. publ. Hlth*, 44, 10, pp. 1305–1313, 2 figs., 1954.

In studies at the University of Kansas, Lawrence, standard water purification processes were applied to samples of tap water or untreated river water which had been sterilized and inoculated with the mycelial phase of *Histo-*

plasma capsulatum [2, No. 1021 and next entry]. Sedimentation by natural settling or settling following coagulation with lime and alum resulted in the concentration of the majority of the spores in the sediment. Rapid sand filtration did not effect a complete removal of either the yeast or the mycelial phase from tap water and there was little difference in results using 3, 12, 24, or 30 in. of sand. In chlorination experiments, *H. capsulatum* was killed by contact with 0.35 p.p.m. free available chlorine for six hours or 1.8 p.p.m. for 60 minutes at pH 7.4 and 26° C. The minimum effective contact times for these concentrations were calculated to be four hours and 35 minutes, respectively.

2086. METZLER (D. F.), RITTER (CASSANDRA), & CULP (R. L.). **Combined effect of water purification processes on the removal of *Histoplasma capsulatum* from water.**—*Amer. J. publ. Hlth*, 46, 12, pp. 1571–1575, 1956.

At the Division of Sanitation, State Board of Health, Lawrence, Kansas, the routine processes of plain sedimentation, coagulation, settling, and rapid sand filtration, as practised in water filtration plants, completely eliminated the spores of *Histoplasma capsulatum* from inoculated sterilized Kansas River water, even before the application of chlorination treatment [see preceding entry].

The membrane filter technique proved to be suitable for the growth and enumeration of fungus colonies.

2087. MYERS (J. A.), BOYNTON (RUTH E.), KERNAN (P.), COWAN (D.), & JABLON (S.). **Sensitivity to fungal antigens among Students at the University of Minnesota.**—*Amer. Rev. Tuberc.*, 73, 5, pp. 620–636, 1956.

This paper, from the Students' Health Service, School of Public Health, and the Department of Internal Medicine, University of Minnesota, reports a survey of reaction to histoplasmin, blastomycin, and coccidioidin in 12,099 students of the University of Minnesota.

Reactors to a triple antigen were examined for reaction to the three separate antigens. Cross reactions between histoplasmin and blastomycin [cf. 2, No. 1261] were extremely frequent, only 11 out of 295 blastomycin reactors failing to respond also (and often more strongly) to histoplasmin.

Most calcifications revealed by X-rays were attributable to previous infection with *Histoplasma capsulatum*, of which the incidence in the State was found to be higher than anticipated. Military service had no noticeable overall effect on reaction rates, though a few men who had served in areas of endemic coccidioidomycosis reacted to coccidioidin. A map is given of the endemic areas of histoplasmosis in Minnesota, and the reactor percentages for individual counties are presented in a table.

2088. HAZEN (ELIZABETH L.) & GREENE (C. H.). **Quantitative complement-fixation tests for evidence of histoplasmosis and blastomycosis.**—*Rep. Div. Lab. Res. U.S. Dep. Hlth*, 1955, pp. 94–96, 1955.

Some difficulty was experienced in producing rabbit antisera of high titre against *Blastomyces dermatitidis* but this was overcome and titres of 700 and more were obtained by serial intravenous injection followed by intraperitoneal injection.

Work (initiated by Rachel Brown in 1953) was resumed on the production of a highly specific and sensitive antigen of *Histoplasma capsulatum* by fractional alcoholic precipitation of saline extracts of acetone-dried yeast phase cells. Yields of what appears to be a specific antigen are very low, and other methods are to be investigated.

2089. HAZEN (ELIZABETH L.), LITTLE (G. N.), & MORDAUNT (VERNA). **A study of specimens for evidence of myotic infection.**—*Rep. Div. Lab. Res. U.S. Dep. Hlth*, 1955, pp. 92–94, 1955.

A man aged 37 developed histoplasmosis [*Histoplasma capsulatum*], with chest pains, nausea, and high temperature, two weeks after felling a decayed tree. X-rays revealed nodular densities throughout both lungs, with hilar enlargement, and he gave a strong positive reaction (titre 90) to the complement fixation test for histoplasmosis. The organism was obtained by direct culture and by animal inoculation from lymph nodes from the supraclavicular area. The patient's brother, who assisted in the tree cutting, gave a strong reaction to the histoplasmin test and to the complement fixation test (titre 85). Reactivity to the latter test fell rapidly a month later. There were no significant X-ray findings, and he was assumed to have had asymptomatic benign histoplasmosis.

2090. LARSH (H. W.), HINTON (AGNES), & SILBERG (S. L.). **Conversion and maintenance of *Histoplasma capsulatum* in tissue culture.**—*Proc. Soc. exp. Biol.*, N.Y., 93, 3, pp. 612–615, 2 graphs, 1956.

At the Communicable Disease Center, United States Department of Health, Kansas City, the tissue culture method [1, No. 2138] was successfully used for the conversion of *Histoplasma capsulatum* [see next entry] to the tissue phase. Six out of 13 isolates were not converted in the absence of HeLa (animal) cells, and in all cases the process was more complete and rapid in their presence. The yeast phase of the fungus can be propagated and maintained in tissue culture media without HeLa cells in 100 ml. centrifuge bottles. Rotation of cultures is essential to ensure maximum growth of yeast cells in tissue culture medium.

The tissue culture technique is also applicable for the conversion to the tissue phase of *Blastomyces dermatitidis*, *Sporotrichum schencki*, and *Coccidioides immitis*. *Candida albicans* and *Cryptococcus neoformans* can be propagated in tissue culture medium without HeLa cells.

2091. HINTON (AGNES), LARSH (H. W.), & SILBERG (S. L.). **Direct exposure of Mice to soils known to contain *Histoplasma capsulatum*.**—*Proc. Soc. exp. Biol.*, N.Y., 94, 1, pp. 176–179, 1957.

At the Communicable Disease Center, Kansas City Field Station, the susceptibility of white Swiss mice to infection by *Histoplasma capsulatum* [see preceding entry] through inhalation of dust aerosol was determined by direct exposure to known positive soil samples. Disseminated histoplasmosis developed in a large percentage of the experimental animals. Naturally contaminated soil samples held for up to 10 months at room temperature remained highly infectious. Inoculated soil cultures caused 100 per cent. infection in mice exposed for one, two, four, and seven days. These data are considered to support the hypothesis that infections by *H. capsulatum*, both in man and animals, is contracted through the respiratory route.

A safety hood for the accommodation of the cages and associated precautions proved completely effective in preventing the infection of controls in close proximity to the exposed mice.

2092. LITTMAN (M. L.). **Liver-spleen glucose blood agar for *Histoplasma capsulatum* and other fungi.**—*Amer. J. clin. Path.*, 25, 10, pp. 1148–1159, 1955. [*B.A.*, 30, No. 20028.]

At the Mount Sinai Hospital, New York, heat-stable substances obtained by aqueous extraction from beef liver and beef spleen stimulated the growth in culture of *Histoplasma capsulatum*.

2093. PEABODY (J. W.), MURPHY (J. D.), & SEABURY (J. H.). **Demonstration of fungi by periodic acid-Schiff stain in pulmonary granulomas.**—*J. Amer. med. Ass.*, 157, 11, pp. 885–888, 4 figs., 1955.

From the Veterans' Administration Hospital, Oteen, North Carolina, descriptions are given of two cases originally diagnosed as tuberculosis in the absence of positive bacteriological findings. In both the diagnosis was changed to pulmonary histoplasmosis [*Histoplasma capsulatum*] after histological examination by the periodic acid-Schiff technique of biopsy lung tissue.

2094. SCHWARZ (J.), BINGHAM (EULA), & ROUBENOFF (D.). **The communicability of experimentally induced histoplasmosis.**—*Amer. J. clin. Path.*, 25, 8, pp. 932–934, 1955. [*B.A.*, 30, No. 20031.]

At the Jewish Hospital, Cincinnati, Ohio, it was found that the faeces of mice inoculated intravenously with the mycelial phase of *Histoplasma capsulatum* were infectious, the organism being recoverable from single and pooled samples of stools by mouse passage. Urine and washings of sawdust from the cages were negative.

2095. SASLAW (S.) & SCHAEFER (J.). **Relation of sex and age to resistance of Mice to experimental *Histoplasma* infections.**—*Proc. Soc. exp. Biol.*, N.Y., 90, 2, pp. 400–402, 1955.

At the College of Medicine, Ohio State University, Columbus, white Swiss mice aged 5 to 23 weeks were inoculated intraperitoneally with 23 or 35×10^6 cells of the yeast phase of *Histoplasma capsulatum* [2, No. 1848] in 0.5 ml. of five per cent. hog gastric mucin. Females developed resistance to fatal infection earlier than males, an increased resistance being noted first in 8-week-old females and 10-week-old males with the smaller dose, and in 9-week-old females and 17-week-old males with the larger dose. The difference between the sexes was most marked in the 8 to 14-week age group, where the combined death rate for females was 55.3 per cent. with the smaller dose and 65.2 per cent. with the larger dose, compared with 65.6 per cent. and 88.4 per cent. respectively for males. In the 15 to 23 week age group there was no significant difference in death rate between the sexes.

2096. MARIAT (F.) & SEGRETAINE (G.). **Étude mycologique d'une histoplasmose spontanée du Singe africain (*Cynocephalus babuin*).** [Mycological study of a spontaneous histoplasmosis of the African Monkey (*Cynocephalus babuin*)].—*Ann. Inst. Pasteur*, 91, 6, pp. 874–891, 2 pl., 4 figs., 1956.

This is an amplified account of studies on five cases of chronic histoplasmosis (*Histoplasma capsulatum*) in African monkeys (*Cynocephalus babuin*) originating in French Guinea and maintained in captivity at the Pasteur Institute, Paris, for periods of $1\frac{1}{2}$ to two years [2, No. 1851].

2097. PACOSA (W.) & EMMONS (C.). **Histoplasmosis.**—*Clin. Proc. Child. Hosp.*, Wash., 11, 5, pp. 95–102, 2 figs., 1955.

A case of febrile illness in a 12-year-old boy patient at the Children's Hospital, Washington, D.C., is reported with a presumptive diagnosis of histoplasmosis (*Histoplasma capsulatum*), based on the presence of miliary lesions throughout both lung fields; dermal sensitivity to histoplasmin; circulating antibodies against the fungus; a suggestive history of exposure to litter from an old chicken-house; and isolation of the pathogen from chicken manure and litter [cf. 2, Nos. 2075, 2076].

2098. LINDEBOOM (G. A.), HOOGENDIJK (J. L.), & HOOGENDIJK-VAN DORT (T. E.). **Histoplasmosis.** [Histoplasmosis.]—*Ned. Tijdschr. Geneesk.*, 100 (ii), 17, pp. 1227–1233, 5 figs., 1956. [English summary.]

This is a report on the clinical course and autopsy findings in a case of histoplasmosis (*Histoplasma capsulatum*) in a 45-year-old male patient at the Juliana Hospital, Amsterdam. The illness, contracted in Java [2, No. 1855] was marked by prolonged fever, anaemia, enlargement of the spleen, and excrescences in the mouth, smears from which revealed the presence of the fungus. Cultures from the tongue were inoculated into mice with positive results.

2099. BRYNER (S.) & KAUFMAN (S. F.). **Pulmonary histoplasmosis. A report of two cases.**—*Calif. Med.*, 86, 1, pp. 47–50, 3 figs., 1957.

The two cases of pulmonary histoplasmosis (*Histoplasma capsulatum*) herein reported from California illustrate the importance of identification of the etiological agent of intrathoracic granulomata to avoid confusion with tuberculosis and other diseases characterized by similar symptoms. One of these patients, a 34-year-old male, was successfully treated by wedge resection, while careful observation of the other, a 26-year-old female, excluded other potential pathogenic agencies.

2100. JORESS (M. H.) & BUSHUEFF (B. P.). **Disseminated pulmonary calcification: its association with a positive reaction to histoplasmin antigen.**—*New. Engl. J. Med.*, 254, 23, pp. 1053–1058, 5 figs., 1956.

From the Departments of Thoracic Diseases and Radiology, Veterans' Administration Outpatient Clinic, Boston, Massachusetts, the authors present a detailed analysis and discussion of 20 cases of disseminated pulmonary calcification. Ten of the patients came from the central or endemic States [2, Nos. 1825, 1827, 1837 *et passim*]; of the remainder, eight had spent their entire lives in Massachusetts and one each in Pennsylvania and Rhode Island. Of the group analysed, 10 gave no previous history of respiratory infections, but two of these had been exposed to massive inhalation of soil dust while working as labourers in the central States. Of the 18 on whom antigen skin tests were performed, all reacted positively to histoplasmin, one to coccidioidin, and nine to tuberculin. The sera of two out of 15 patients were proved to contain antibodies 12 and 11 years, respectively, after the initial episode of respiratory infection: in the first case (regarded by Dr. M. Furcolow as 'doubtful') the reaction to titration by the yeast-phase antigen of *Histoplasma capsulatum* was 1:4 and in the second 1:14.

2101. MACINNIS (F. E.). **Broncholithiasis and histoplasmin sensitivity.**—*Missouri Med.*, 52, 11, pp. 868–870, 1955.

The author reports the case of a woman with severe broncholithiasis who was positive to the histoplasmin but negative to the tuberculin test. He comments that though this condition is well known to be a possible sequel to tuberculosis, the healed primary complex of histoplasmosis [*Histoplasma capsulatum*] is also a possible cause.

2102. STANKAITIS (J.) & MCCUSKEY (M. C.). **Fatal lymphadenopathy type of histoplasmosis.**—*Ohio med. J.*, 51, 9, pp. 855–857, 3 figs., 1955.

The case of histoplasmosis (*Histoplasma capsulatum*) herein reported was that of a 56-year-old woman who succumbed to the illness after 74 days at the Guernsey Memorial Hospital, Cambridge, Ohio, and is believed to be the first record for the south-east of the State. Involvement was primarily lymph-

phatic and the vulva was the probable portal of entry. Infection is thought to have been acquired from two members of the family (both in good health) with strongly positive reaction to histoplasmin skin tests; they had resided in Alabama for seven years and 17 months, respectively, before spending eight months with the patient.

2103. SYMMERS (W. St. C.). **Localized cutaneous histoplasmosis.**—*Brit. med. J.*, 1956, 4996, pp. 790–792, 1 fig., 1956. [B.H., 32, p. 36].

The author reports histoplasmosis, suspected to be of the African type (*Histoplasma capsulatum* var. *duboisii*) [*Histoplasma duboisii*; 2, No. 1142] in two Nigerian students who had recently arrived in Great Britain. One of the patients, a man aged 28, developed a pustule on the cheek, which was incised but persisted afterwards as a painless nodule. After 18 months it began to enlarge and became ulcerated at the centre. This lesion, which resembled a rodent ulcer, was excised. Histological examination revealed a granuloma of multinucleate giant cells containing large capsulated yeast-like bodies, measuring $10-12 \times 8-10 \mu$, and some smaller intercellular forms. *H. capsulatum* was isolated in culture. There was no recurrence of the disease in the patient, who was kept under observation for four years.

The other patient, a woman of 23, exhibited an oval skin lesion, measuring 2×1 cm., over the lower end of the sternum. The margin, about 0.4 cm. wide, was slightly raised and indurated, forming a ring-like figure sharply limited at the outer edge but fading away towards the healing centre of the lesion. The histological findings from a biopsy specimen were as in the previous case. No treatment was given and the lesion disappeared spontaneously within a year.

Experimental infection of laboratory animals, which is necessary to establish beyond doubt the identity of *H. duboisii*, was not carried out.

2104. NEJEDLY (R. F.) & BAKER (L. A.). **Treatment of localized histoplasmosis with 2-hydroxystilbamidine.**—*Arch. intern. Med.*, 95, 1, pp. 37–40, 3 figs., 1955.

At the Veterans' Administration Hospital, Hines, Illinois, ulceration of the hard palate and gingiva caused by *Histoplasma capsulatum* disappeared following treatment [route not stated] with a total of 20 mg. stilbamidine. While lesions may clear spontaneously the author considers that this result justifies a further trial of the drug.

2105. ANONYMOUS. **New antibiotics.**—*Amer. Prof. Pharm.*, 20, 2, pp. 141–142, 1954.

Ascospin, an antibiotic derived from *Streptomyces canescens*, prolongs the survival of mice with experimental histoplasmosis, reducing the number of viable organisms in the spleen and liver. The therapeutic level, however, is near the toxic level.

2106. SASLAW (S.) & SCHAEFER (J.). **The in vitro and in vivo effect of synkayvite on *Histoplasma capsulatum*.**—*Proc. Soc. exp. Biol.*, N.Y., 92, 4, pp. 819–823, 1956.

At the College of Medicine, Ohio State University, Columbus, synkayvite Roche (tetrasodium 2-methyl-1, 4-naphthohydroquinone diphosphoric acid ester), a vitamin K preparation, at a concentration of 0.15 mg. per ml. completely inhibited the growth of *Histoplasma capsulatum* on brain-heart infusion agar slants. A comparable effect was exerted by the compound at 0.3 to 0.6 mg. on *Nocardia asteroides*, *N. brasiliensis*, *Trichophyton mentagrophytes*,

Epidermophyton floccosum, *Aspergillus fumigatus*, and *Scopulariopsis* sp., but *Microsporum canis* withstood concentrations up to 1.3 mg.

Six-week-old, normal male Swiss white mice could tolerate a single intraperitoneal or subcutaneous inoculation of synkayvite up to 0.4 but not 0.45 mg. per gm. body weight, or up to 0.15 mg. daily for 28 days. Infection with *H. capsulatum*, however, prevented toleration of doses non-toxic to normal mice, especially during the period between one and three weeks after inoculation. In view of these results it is suggested that naphthoquinone medication in acute histoplasmosis might aggravate the disease.

2107. TSUCHIYA (T.), MIYASAKI (T.), & FUKAZAWA (Y.). **Studies on the classification of the genus *Candida*. Comparison of antigenic structures of standard and other strains.**—*Jap. J. exp. Med.*, 25, 1, pp. 15–21, 1955.

In previous reports from the Faculty of Medicine, Juntendo University, Japan (*Jap. J. Bact.*, 9, p. 449, 1954; *Jap. J. exp. Med.*, 24, p. 95, 1954; *Juntendo med. J.*, 1, p. 20, 1955), the authors described antigenic analyses of *Candida albicans*, *C. stellatoidea*, *C. krusei*, *C. pseudotropicalis*, *C. guilliermondi*, *C. parakrusei*, and *C. tropicalis* and postulated the antigenic structure of the species. The results of further studies demonstrated the almost complete agreement of the structure thus determined with many other strains besides the seven standard ones. The method is therefore considered to serve as a reliable basis of classification for the genus.

2108. TSUCHIYA (T.), FUKAZAWA (Y.), MIYASAKI (F.), & KAWAKITA (S.). **Studies on the classification of the genus *Candida*. Thermostable and thermolabile antigens of the seven species of the genus *Candida*.**—*Jap. J. exp. Med.*, 25, 3, pp. 75–83, 1955.

In further investigations in the present series, slide-agglutination analyses of the above-mentioned species of *Candida* [see preceding entry] led to the subdivision of the antigens into nine thermostable and three thermolabile. *C. albicans* and *C. tropicalis*, which had not formerly been separated antigenically, were differentiated by the presence in the former of one antigen absent from the latter. *C. albicans* contained seven thermostable antigens, *C. tropicalis* six, *C. pseudotropicalis* two, *C. krusei* three, *C. parakrusei* four, and *C. guilliermondi* and *C. stellatoidea* five each. *C. pseudotropicalis*, *C. krusei*, and *C. parakrusei* each harboured a different thermolabile antigen.

Ten kinds of monospecific antisera homologous to each of the thermostable or thermolabile antigens were prepared on the basis of this revised antigenic structure.

2109. HALEY (L. D.) & STONEROD (M. H.). **A study of methods used in the identification of *Candida albicans*.**—*Amer. J. med. Technol.*, 21, 6, pp. 304–308, 1955.

In this study at the Department of Microbiology, Yale School of Medicine, 18 strains of *Candida albicans* were inoculated by five methods on to four media. No single method induced chlamyospore formation in all strains. Small inocula were best, and eosin-methylene blue agar gave characteristic 'feathering'. Following this work the Yale–New Haven Medical Centre has introduced a routine in which the organism suspected to be *Candida* is subcultured from the original medium to eosin-methylene blue agar and to beef extract agar. Growth on the former is observed for 'feathering' and a small amount of growth from the third generation on the latter is subcultured to Zein agar. If chlamyospores are not developed the fungus is then studied for its fermentation reactions. The observation of 'feathering' on methylene blue commonly permits identification in 18 hours.

2110. WINNER (H. I.). **A study of *Candida albicans* agglutinins in human sera.**—*J. Hyg.*, 53, 4, pp. 509–512, 1955.

At the Charing Cross Hospital, London, 2,017 sera received for the Wassermann reaction were tested by slide agglutination. Six hundred and thirty-eight, of which a significantly greater portion were from females, yielded positive results, though ante-natal cases gave a lower incidence than other women. Examination of the sera of 121 patients known to be infected with *Candida albicans* [2, No. 1305] and 380 controls, by a quantitative agglutination technique in tubes, using the stock strain of *C. albicans* and where possible the patient's own strain, showed agreement between the results with the two strains. No significant rises in titre occurred during the course of the disease, nor was there any important difference in titre between the infected and control groups.

2111. SKOBEL (P.), SCHABINSKI (G.), & ESSIGKE (G.). **Untersuchungen über die Immunitätslage and den Wert der Serodiagnostik bei *Candida*-Mykosen.** [Studies on the status of immunity and the value of serodiagnosis in *Candida* mycoses.]—*Ärzt. Wschr.*, 11, 14–15, pp. 317–320, 3 graphs, 1956.

The results of the application of the intracutaneous test with *Candida albicans* antigen [2, No. 1600] to 604 patients of the Children's, Medical, and Tuberculosis Clinics at Jena, Germany, are reported and discussed. Antibody formation commenced in infancy in response to latent thrush infection, 9 per cent. reacting positively between the ages of 10 days and three months. The number of positive reactors among juveniles continued to increase sharply, reaching a peak of 80 per cent. during school age. The corresponding percentages in adult patients in tuberculosis and general clinics were 78 and 61, respectively. A case of pulmonary mycosis is briefly described in which serological methods were of material assistance in the establishment of a diagnosis.

2112. MEYER-ROHN (J.) & LANGE-BROCK (T.). **Untersuchungen zur Frage der Wachstumsstimulierung von *Candida albicans* durch Antibiotika.** [Studies on the question of growth stimulation in *Candida albicans* by antibiotics.]—*Arch. klin. exp. Derm.*, 204, 1, pp. 58–69, 8 graphs, 1957.

Tested in the Warburg respirometer at the University Skin Clinic, Hamburg-Eppendorf, bacitracin and streptomycin caused an appreciable increase in the growth of *Candida albicans* in a synthetic nutrient solution. The action of penicillin was much weaker and that of chloramphenicol barely perceptible, while aureomycin [cf. 2, No. 2114] and terramycin were without effect. Under comparable conditions a vitamin-B complex ('polybion' Merck) afforded a powerful stimulus to the development of the fungus.

2113. RAMACHANDRAN (K.) & WALKER (T. K.). **Glucose metabolism in *Candida* species.**—*Biochem. J.*, 65, 1, pp. 20–24, 1957.

At the College of Technology, University of Manchester, 19 cultures of *Candida* spp., including *C. krusei*, thrived in simple media of inorganic salts and glucose with either ammonium phosphate or ammonium sulphate as the source of nitrogen. All formed pyruvic acid, one or more other organic acids, and ethanol. They were unable to utilize nitrates and their growth and acid forming capacity were restricted by the addition of nitrite to the medium.

When thiamine hydrochloride (1 μ gm. per ml.) was added to cultures of *C. krusei*, the rate of glucose utilization was increased, the accumulation of pyruvic acid inhibited, and the ethanol yield was heavier than that provided by the controls without thiamine. The rate of glucose utilization in cultures of *C. krusei* supplemented by sodium arsenite (0.002 M) was reduced and ethanol production substantially increased.

2114. GRAM (H. G.). **Antibiotica als Stickstoffquelle für *Candida albicans*.** [Antibiotics as a source of nitrogen for *Candida albicans*.]—*Zbl. Bakt., Abt. 1* (Orig.), 166, 3-4, pp. 199-205, 2 diags., 1956. [English, French, and Russian summaries.]

Using a modification of Beijerinck's auxanographic method, the author demonstrated in experiments at the Pathological-Bacteriological Institute of the Municipal Hospitals, Karlsruhe, Germany, that *Candida albicans*, cultured on minimal nutrient media, utilizes tetracycline, aureomycin, and terramycin as sources of nitrogen. No growth was made when penicillin or streptomycin was offered as a substitute for the foregoing.

2115. FORNI (P. V.), CAUDA-DI PUMA (A.), & MAGHENZANI (P.). **Aminoacidossidasi dei miceti del genere *Candida*.** [Oxidation of amino acids by fungi of the genus *Candida*.]—Reprinted from *Med. sper.*, 26, 19 pp., 6 graphs, 1955. [French, English, and German summaries.]

At the Istituto di Patologia Generale, University of Turin, the authors used the Barcroft-Warburg manometric technique in a study of amino acid catabolism in *Candida albicans*, *C. tropicalis*, *C. pseudotropicalis*, *C. krusei*, *C. parapsilosis*, *C. guilliermondii*, *C. brumptii*, and *C. stellatoidea*. He concluded that they differed in their enzymatic constitution, breaking down amino acids either by oxydeamination or by different and more complex mechanisms.

2116. PAULATOU (M.) & MARCELOU (U.). **Milieu favorisant la formation des chlamydospores de *Candida albicans*.** [A medium favouring the formation of chlamydospores by *Candida albicans*.]—*Ann. Inst. Pasteur*, 91, 3, pp. 410-413, 1956.

At the Alexandra Hospital, Athens, 63 strains of *Candida albicans* and two of *C. stellatoidea* produced pseudomycelia and chlamydospores in 18 to 22 hours on a medium of potato-carrot agar with the addition of 20 per cent. ox gall.

2117. NICKERSON (W. J.), TABER (W. A.), & FALCONE (G.). **Physiological bases of morphogenesis in fungi. 5. Effect of selenite and tellurite on cellular division of yeast-like fungi.**—*Canad. J. Microbiol.*, 2, 6, pp. 575-584, 18 figs., 1956.

At the Institute of Microbiology, Rutgers University, New Brunswick, New Jersey, the inclusion of selenite or tellurite in glucose-glycine-yeast extract agar caused *Candida albicans*, which is usually filamentous on this medium, to grow exclusively in the yeast phase. The mechanism of the phenomenon is discussed.

2118. HILL (D. W.) & GEBHARDT (L. P.). **Morphological transformation of *Candida albicans* in tissues of Mice.**—*Proc. Soc. exp. Biol., N.Y.*, 92, 3, pp. 640-644, 1 fig., 1956.

At the University of Utah College of Medicine, Salt Lake City, the yeast-like cells of *Candida albicans* and *C. stellatoidea* formed elongated pseudomycelia within an hour of injection into the subcutaneous tissues of adult albino mice. Subsequently these filaments made considerable growth and produced septa. The five other species used in the tests retained their typical yeast-like morphology.

It is postulated that filamentation of *C. albicans in vivo* acts as a mechanical hindrance to ingestion of the fungus by the host phagocytes, and the results of these experiments suggest a significant function for these morphologically altered organisms in the pathogenesis of experimental moniliasis in the mouse.

2119. BICHEL (J.) & STENDERUP (A.). **Experimental investigations on the effect of *Monilia (Candida albicans)* on lymphopoiesis in Mice.**—*Acta path. microbiol. scand.*, 37, 2, pp. 157–162, 1955. [*Bull. Signalét. C.N.R.S.*, 17, No. 141146.]

Experimental moniliasis (*Candida albicans*) in mice produced lymphocytopenia without atrophy of the lymphatic system.

2120. DONOMAE (I.) & KAWAMORI (Y.). **Moniliasis.**—*J. Antibiot.*, Ser. A, 8, 6, pp. 171–180, 1955. [*Bull. Signalét. C.N.R.S.*, 17, No. 141147.]

Details are given of the diagnosis and course of infection in some cases of moniliasis (*Candida albicans*) observed in Japan. The authors note that the pathogenicity of the organism is increased when it is associated with *Proteus vulgaris* or *Pseudomonas aeruginosa*, both of which are resistant to antibiotic therapy.

2121. ARMSTRONG (ELIZABETH C.) & HALL (J. A.). **The incidence of *Candida* species in routine specimens of sputum.**—*Mon. Bull. Minist. Hlth Lab. Serv.*, 15, 9, pp. 220–224, 1956.

The incidence of *Candida* spp. in 307 routine specimens of sputum from chest clinic and hospital patients suspected of harbouring pulmonary tuberculosis was investigated at the Public Health Laboratory, Blakeland, Newcastle-on-Tyne. A total of 200 strains of yeasts was isolated from 195 specimens (63·5 per cent.), of which 157 (78·5 per cent.) were identified as *C. albicans*, the corresponding figures for *C. tropicalis*, *C. pseudotropicalis*, and *C. krusei* being 10, 3, and 6 (5, 1·5, and 3), respectively.

2122. HELMS (P.). **The occurrence of *Candida albicans* in sputum in Denmark.**—*J. clin. Path.*, 9, 4, pp. 372–373, 1956.

The incidence of *Candida albicans* in sputum specimens [see preceding entry] from 205 patients attending chest clinics at Viborg and Thirsted, Jutland, from 1952 to 1953 for a variety of complaints was 73 per cent. for males and 81 per cent. for females. None of these patients had received antibiotics. The incidence varied little from one age group to another.

2123. STAIB (F.) & WINDISCH (S.). **Über das Vorkommen von Hefen im Darmtrakt Kranker. 2. Mitteilung. Die Begleitflora der Hefen des Darmkanals.** [On the occurrence of yeasts in the intestinal tract of Invalids. Note 2. The concomitant flora of the yeasts of the intestinal canal.]—*Zbl. Bakt.*, Abt. 1 (Orig.), 166, 3–4, pp. 302–315, 1956. [English, French, and Russian summaries.]

Among the 90 patients at the Central Clinics, Göppingen, Germany, harbouring *Candida albicans* in the intestinal tract [2, No. 1879] were 34 with a prolific growth of the yeast. In only 17 out of 86 with rarer species was the development equally luxuriant. *C. albicans* tended to become more abundant as the patient's condition degenerated, limiting the growth of *Escherichia coli* and largely inhibiting that of streptococci. The less frequent yeasts were associated almost exclusively with specific diseases of the intestinal tract and its appendicular organs.

2124. WINTER (W. J.) & FOLEY (G. E.). ***Candida* infections in Children with neoplastic disease. Influence of therapy with antibiotics and steroid hormones.**—*Pediatrics, Springfield*, 18, 4, pp. 595–663, 2 graphs, 1956. [Summary in Interlingua.]

This is a report from the Children's Cancer Research Foundation and Departments of Pathology and Pediatrics, Harvard Medical School, at the

Children's Medical Center, on a one-year-study of 156 patients at the Tumor Therapy Clinic and 1,004 general patients. It revealed a significantly increased rate of carrier infection by *Candida* spp. (*C. albicans* predominating) in the former group (74 per cent.) as compared with the latter (15). The carrier rate was also increased in members of the control group suffering from diabetes mellitus, cystic fibrosis of the pancreas, nephrotic syndrome, and rheumatic disease. The development of localized or disseminated infection by *C. spp.* (which also included *C. tropicalis*, *C. pseudotropicalis*, *C. krusei*, and *C. parapsilosis*) was consistently associated with vigorous antibiotic therapy and ultimately poor general clinical condition.

2125. MAYER (J. B.). **Pilzkrankungen und moderne Pädiatrie.** [Fungus diseases and modern pediatrics.]—*Kinderärztl. Prax.*, 23, 9, pp. 406–417, 461–465, 1955.

This is a critical discussion of recent contributions to the literature on mycoses and their treatment in modern pediatric practice, with special reference to endogenous and exogenous thrush (*Candida albicans*) [see next entry] in the light of the author's experience at the University Clinic of Homburg and the Municipal Children's Clinic Neuenkirchen-Kohlhof (Saar), Germany.

2126. PLENERT (W.). **Der Hautsoor im Säuglingsalter.** [Cutaneous moniliasis in infancy.]—*Kinderärztl. Prax.*, 23, 11, pp. 481–485, 4 figs., 1955.

The symptoms of the various types of moniliasis (*Candida* spp.) affecting infants are described from the Children's Clinic of the University of Greifswald, Germany, with brief indications for their control [see preceding entry]. They range from narrowly localized efflorescences to disseminated infections partially simulating Leiner's erythrodermia desquamativa.

2127. GONZÁLEZ OCHOA (A.), DOMÍNGUEZ (L.), & MACOTELA (E.). **Tratamiento de la moniliasis oral con nystatin.** [Treatment of oral moniliasis with nystatin.]—*Rev. Inst. Salubr. Enferm. trop., Méx.*, 15, 4, pp. 195–203, 1 graph, 1955. [English summary.] [*B.H.*, 31, p. 1226.]

The authors report the successful treatment of oral thrush (*Candida albicans*) in all of 75 children aged from 3 days to five years, with no untoward effects. An ointment capable of adhering to the affected mucous membrane was prepared by mixing oral nystatin [mycostatin] powder and chocolate with lanolin and paraffin, the final concentration of mycostatin being 50,000 units per gm. of ointment. Another ointment containing 100,000 units per gm. of 'plasti-base' was also used. Ointment was applied three times a day, treatment being discontinued as soon as the lesions cleared. The average course of treatment lasted 2.4 days (maximum seven days) and was generally, though with notable exceptions, related to the extent of the lesions, but not to the duration of the disease, before treatment was started. In four cases there was relapse about eight days after apparent cure, final cure being effected by a further three days' treatment.

Acute diarrhoea, associated with the presence of a great quantity of *C. albicans* in the stools, responded promptly to mycostatin chocolate.

2128. FISCHER (G. W.). **Therapieversuche bei der experimentellen aureomycin-aktivierten Soorinfektion.** [Experiments in the therapy of experimental thrush infection activated by aureomycin.]—*Z. Hyg.-Infektkr.*, 143, 2, pp. 140–150, 5 graphs, 1956.

At the Institute for Hygiene of the University of Homburg, Saar, Germany,

the author found mycostatin superior to 2, 2'-dioxy-5, 5'-dichlorophenyl-sulphide or anti-thrush immune serum in the therapy of thrush (*Candida albicans*) activated by aureomycin [cf. 2, Nos. 1874-1876, 1882, 1883] in mice, but even large and repeated doses of the first-named failed to eliminate infection completely.

2129. GRANELLI (U.). **Sopra un caso di uretrite di origine micotica.** [A case of urethritis of mycotic origin.]-*Minerva dermatol., Tor.*, 30, 7, pp. 191-193, 1955.

This is a clinical account of urethritis in a male patient aged 40, caused by *Candida albicans*.

2130. LUTZ (A.) & WITZ (Mme M.-A.). **L'action comparée in vitro de la nystatine et de la trichomycine sur des champignons levuriformes du genre *Candida* provenant de vulvo-vaginites.** [The comparative action *in vitro* of nystatin and trichomycin on yeast-like fungi of the genera *Candida* from cases of vulvo-vaginitis.]-*Ann. Inst. Pasteur*, 92, 2, pp. 272-276, 1957.

Yeast-like fungi, specially *Candida albicans*, abounded in samples of mucus from cases of vulvo-vaginitis examined at the Departmental Laboratory of Bacteriology, Strasbourg, France. In serial dilution tests the growth of the organisms on a modification of the medium of Williams *et al.* (*Publ. Univ. Tex.*, 37, p. 31, 1941), containing 20 gm. glucose, was inhibited by nystatin [mycostatin: 2, Nos. 1343, 1594, and next entries] and trichomycin [2, No. 1436] at concentrations of 2 to 12 and 0.05 to 0.4 units per ml., respectively. The use of the latter antibiotic is of particular interest in cases of mixed infection by *C. albicans* and *Trichomonas vaginalis*, which represented 11.8 per cent. of 126 comprised in a study by the authors.

2131. SEPULVEDA (G.) & IBARRA (L. M.). **Mycostatin for the local treatment of *Monilia* vulvo-vaginitis: a preliminary report.**-*J. Phil. Is. med. Ass.*, 32, 7, pp. 421-428, 7 figs., 1956.

Encouraging results are reported from the Public Health Laboratory, Manila, Philippine Islands, in the treatment of nine cases of vulvo-vaginitis caused by *Candida albicans* with mycostatin in tablet or ointment form [2, No. 1594 and preceding and next entries]. Six of the patients were also suffering from diabetes [cf. 2, No. 1587 *et passim*] and received injections of insulin concurrently with the anti-mycotic treatment.

2132. BRET (A. J.) & BARDIAUX (M.). **Traitement des mycoses vaginales par un nouvel antibiotique antifongique la nystatine ou fungicidine.** [Treatment of vaginal mycoses with a new antibiotic, nystatin or fungicidin.]-*Pr. méd.*, 64, 29, pp. 671-674, 1956.

Excellent results are reported from Paris in the therapy of 20 cases of vaginal mycosis (*Candida albicans*) with nystatin [mycostatin] tablets [see preceding and next entries], applied either locally alone or by combined local and oral administration.

2133. PACE (H. R.) & SCHANTZ (S. I.). **Nystatin (mycostatin) in the treatment of monilial and nonmonilial vaginitis.**-*J. Amer. med. Ass.*, 162, 4, pp. 268-271, 1956. [*B.H.*, 32, p. 35.]

The authors report marked success in the treatment of 59 cases of vaginal moniliasis [*Candida albicans*] in pregnant and non-pregnant women by nystatin [mycostatin: see preceding entries], administered by insertion into the vagina in tablet form. (10,000 units once daily for seven days in cases of moderate severity).

2134. BLINICK (G.). **Hydrocortisone vaginal tablets in vaginal pruritus.**—*Obstet. Gynec.*, 6, 6, pp. 590–591, 1955.

The author reports from the Beth Israel Hospital, New York, that hydrocortisone tablets produced rapid remission of pruritus in all of 28 cases of vaginal moniliasis [*Candida albicans*]. The tablets were given daily over the first four days of a course of treatment with propionate jelly.

2135. JONES (G. E. S.), WOOD (J. L.), BISHOP (D. W.), & DONOHO (R. S.). **Vaginal fungi and their relation to sperm survival.**—*Amer. J. Obstet. Gynec.*, 70, 6, pp. 1271–1276, 1955.

An examination of 160 vaginal cultures from 124 consecutive patients at the Johns Hopkins Hospital, Baltimore, Maryland, revealed *Candida albicans* as the most common pathogenic fungus [cf. 2, Nos. 827, 1067, 1306, *et passim*]. Only one organism, *C. krusei*, appeared to immobilize sperm in the cervical mucus and may play a part in infertility.

2136. KOELLE (W. A.) & PASTOR (B. H.). ***Candida albicans* endocarditis after aortic valvulotomy.**—*New Engl. J. Med.*, 255, 21, pp. 997–998, 1 fig., 1956.

From the Philadelphia Veterans' Administration Hospital the authors present a case of endocarditis in a 40-year-old patient, caused by *Candida albicans* following aortic valvulotomy. The condition is rare, this being only the 18th case on record in the relevant literature. The fungus developed in both ante- and post-mortem cultures and was also demonstrated in tissue sections.

2137. LARROCHE (J. C.). **Trois cas de moniliase pulmonaire chez des prématurés.** [Three cases of pulmonary moniliasis in the prematurely born.]—*Étud. néonatal.*, Fr., 5, 1, pp. 19–29, 1956.

The three cases of pulmonary moniliasis [*Candida albicans*] here described were in children born at six months who lived three and a half, five and 19 days, respectively. There was massive infiltration of the lungs by spores and mycelium, which was probably the cause of death.

2138. LEVIN (E. J.). **Pulmonary intracavitary fungus ball.**—*Radiology*, 66, 1, pp. 9–16, 5 figs., 1956. [Spanish summary.]

The clinical, radiological, and pathological aspects of 23 cases of pulmonary intracavitary fungus ball are reviewed from the literature and four new ones (three proved) reported from Cincinnati (Ohio) hospitals, in which the causal organism was possibly a species of *Candida*.

2139. KUPROWSKI (M.). **O moniliase u gúszców i o entero-hepatitis.** [Moniliasis in Capercaillie in relation to blackhead.]—*Méd. vét., Varsovie*, 12, pp. 201–204, 1956. [In Polish, German and Russian summaries.] [*V.B.*, 26, No. 2824.]

Post-mortem examination of three capercaillie reared in captivity revealed acute enteritis, pale friable liver, and, in one bird, enlargement of the spleen and dilatation of the caeca. Structures morphologically resembling *Candida albicans* were demonstrated histologically and a species of *Candida* was isolated from the liver and lungs.

2140. DRUMMOND (M.). **Clinical and therapeutic aspects of *Candida albicans*.**—*Irish J. med. Sci.*, Sixth Ser., 369, pp. 415–416, 1956.

Calling attention to the general increase in cutaneous moniliasis (*Candida albicans*), especially in conjunction with antibiotic therapy, the author describes from Dublin a case of intense oral infection, necessitating feeding through a nasal tube, in a 47-year-old woman. The administration of one

500,000 unit tablet of mycostatin [see above, No. 2130] thrice daily resulted in disappearance of the symptoms and of a concurrent vulvitis in four days. A thrombophlebitis of the right leg of several months' duration also subsided.

2141. SABALITSCHKA (T.), MARX (H.), & SCHOLZ (URSULA). **Zur Wirkung der p-Oxybenzoesäurealkylester auf den Soor-Erreger *Candida albicans* (Robin) Berkhout.** [The effect of p-oxybenzoic alkyl esters on the agent of thrush, *Candida albicans* (Robin) Berkhout.]—*Arzneimittelforsch.* 5, 5, pp. 259–262, 1955.

The authors studied the action *in vitro* of p-oxybenzoic alkyl esters on six strains of *C. albicans* isolated from the urine of young children. At 37° C. the higher aliphatic p-hydroxybenzoic esters, especially a combination of two butyl esters, was more effective than the methyl ester (nipagin M). At 20° C. the action of the methyl ester was much reduced and markedly inferior to that of the higher esters.

2142. GARNIER (G.). **Traitement des affections à levures des muqueuses par un nouvel antifongique.** [Treatment of yeast infections of the mucous membranes with a new fungicide.]—*Bull. Soc. franç. Derm. Syph.*, 62, 3, pp. 320–321, 1955.

Good results are reported in the treatment of cases of vaginitis, stomatitis, and glossitis due to *Candida albicans* by topical applications of 2 per cent. 2-2'-dihydroxy-5-5'-dichlorophenylmethane.

2143. REITER (C.). **A treatment for monilial paronychia.**—*Arch. Derm. Syph. Chicago*, 73, 2, p. 165, 1956.

The author has obtained greatly improved results in the treatment of monilial paronychia [*Candida albicans*] by painting a silicone compound ('Pro-Derna', a product of the Westwood Pharmaceutical Corporation) over the affected parts each morning as a protective against the aggravating effect of repeated immersion in water. In this condition it is important that the fungicidal preparation should be applied with a fine brush, affording good penetration without disturbance.

2144. SCHERR (G. H.). **The therapeutic effect of cortisone, somatotrophic hormone and hesperedin methyl chalcone in suppressing experimental moniliasis in mice.**—*Mycopathologia*, 7, 3–4, pp. 321–327, 1956.

In further work at the Creighton University School of Medicine, Omaha, Nebraska, the severity of *Candida albicans* infection in female mice was markedly reduced by treatment with a mixture of cortisone, somatotrophic hormone (STH), and hesperedin methyl chalcone, while similar infection in male mice was unaffected. This difference between the sexes may result from the fact that a greater quantity of STH is required to antagonize certain of the deleterious properties of cortisone in male mice than in female mice.

The author discusses his findings in the light of earlier work [cf. 2, Nos. 565, 804, 1619, and 1073].

2145. UNDERWOOD (P. C.), COLLINS (J. H.), DURBIN (C. G.), HODGES (F. A.), & ZIMMERMAN (H. E.). **Critical tests with copper sulfate for experimental moniliasis (crop mycosis) of Chickens and Turkeys.**—*Poult. Sci.*, 35, pp. 599–605, 1956. [V.B., 26, No. 3417.]

Moniliasis of the crop was produced in chickens by oral inoculation of suspensions of *Candida albicans*. The disease was neither prevented nor cured by copper sulphate in the food and water, which apparently favoured

the establishment of infection in two out of five trials. The experimental disease was generally mild and without symptoms.

2146. RAGASWAMI (G.), SCHAFFNER (C. P.), & WAKSMAN (S. A.). **Isolation and characterization of two mycothricin complexes.**—*Antibiot. & Chemother.*, 6, 12, pp. 675–683, 3 figs., 1 diag., 1956.

The antibiotic substances secreted by two cultures belonging to the *Streptomyces lavandulae* group, isolated from a soil sample at the Institute of Microbiology, Rutgers University, New Brunswick, New Jersey, were found to comprise chemical complexes rather than single entities and are designated mycothricin A and mycothricin B. They are related to the streptothricin group of antibiotics but are differentiable on the basis of their antimicrobial spectra and by paper chromatography. The minimal inhibitory concentrations of both complexes for *Candida albicans* and *C. tropicalis* were 2.5 and 5 μ gm. per ml., respectively. In preliminary studies on toxicity to mice the LD values for complexes A and B were 65 to 130 and 32.5 mg. per kg. body weight, respectively.

2147. **Clinico-pathological conferences. A conference at Sydney Hospital.**—*Med. J. Aust.*, 43 (ii), 1, pp. 30–34, 3 figs., 1956.

This is a report and discussion on a case of combined diabetes mellitus and mucormycosis [2, No. 1918] in a 53-year-old female. The diagnosis of mucormycosis (made post mortem) was based on the appearance of the large, branching hyphae with few or no septa, which showed a marked tendency to invade the blood-vessel walls and grow within their lumina. The fungus was also detected in the frontal lobe of the brain, right eye, and lungs, while a lesion in the adipose tissue near the capsule of the left kidney may also have been due to the same cause.

2148. BAUER (H.), AJELLO (L.), ADAMS (ELIZABETH), & HERNANDEZ (D. U.). **Cerebral mucormycosis : pathogenesis of the disease.**—*Amer. J. Med.*, 18, 5, pp. 822–831, 12 figs., 1955.

Two fatal cases of cerebral mucormycosis (2, Nos. 1357, 1628) occurring as a complication of diabetes mellitus are reported from Emory University, Georgia. *Rhizopus oryzae* was isolated and identified as the infectious agent in one patient, a 40-year-old negro. In the other, a 25-year-old white woman, diagnosis was made by histological examination only. A survey of these cases and nine cases reported by other authors shows a consistent clinical picture of uncontrolled diabetes mellitus with ophthalmoplegia, meningo-encephalitis and sometimes sinusitis. Autopsy may reveal mycelial invasion of the meninges, brain, orbits and paranasal sinuses and marked invasion of the cerebral blood vessels causing the formation of thrombi and emboli. There is little inflammatory reaction except in association with tissue injury following vascular obstruction. It is suggested that the paranasal sinuses are a possible portal of infection and that bacterial infection of the sinuses may be a predisposing factor in the pathogenesis of the disease.

2149. GUNSON (H. H.) & BOWDEN (D. H.). **Cerebral mucormycosis. Report of a case.**—*Arch. Path.*, 60, 4, pp. 440–443, 3 figs., 1955.

A case of cerebral mucormycosis developing as the final stage of chronic glomerulonephritis in an eight-year-old girl is reported from the Hospital for Sick Children, Toronto, Canada [see preceding entry]. The examination of microscopic sections of the brain revealed the true nature of the disease, which had been diagnosed at autopsy as cerebral infarction consequent on vascular

occlusion. The non-septate, frequently branched hyphae in the vessel wall outside the internal elastic lamina and in the basal subarachnoid space measured up to 0.2 mm. in length and ranged from 6 to 15 (average 12) μ in diameter. A few spherical eosinophilic, solid bodies, resembling spores and averaging 12 μ in diameter, were also observed. The feature common both to the present case of cerebral mucormycosis and the nine previously recorded is a debilitating illness.

2150. HAJSIG (M.) & STILINOVIĆ (Z.). **Zapažanja o saharomikozi Kunića.** [Observations on saccharomycosis in Rabbits.]—*Vet. Arhiv.*, 26, 3-4, pp. 81-85, 1956.

From the Veterinary Faculty, University of Zagreb, Yugo-Slavia, the authors report an epizootic at a large rabbit-breeding centre. Affected animals lost appetite, exhibited severe tympanites, and produced sticky mucus-covered faeces, and there was catarrh of the upper respiratory tract and conjunctivae.

Saccharomycopsis guttulata was isolated in great numbers from the faeces and cultured on gelatin with 10 per cent. glycerin (pH 3.5). Vitamin A deficiency was thought to have contributed to the development of the infection, which responded to Aretit 'Bayer' (1 teaspoonful of 0.0005 per cent. solution three times daily) together with treatment for the hypovitaminosis.

2151. JANKE (D.). **Über eine menschenpathogene, aus Lungenveränderungen gezüchtete neue Spezies von Peyronellaea.** [A new species of *Peyronellaea*, cultured from lung lesions.]—*Mycopathologia*, 7, 3/4, pp. 229-240, 13 figs., 1956.

A 49-year-old female agricultural worker with squamous, slightly infiltrated lesions of the thigh was admitted to hospital following a sudden increase of temperature (40° C.). At the University Skin Clinic, Marburg-an-der-Lahn, Germany, typhus was suspected and lung X-ray findings attributed to congestion. Treatment with supronal and penicillin was ineffective and the patient died.

At post-mortem examination a species of *Peyronellaea* was isolated from granules in the lung. Following cultural studies and comparison with strains of *P. glomerata* and *P. hominis* the isolate was taken to be a new species. A Latin diagnosis is given, but no specific epithet.

2152. FUENTES (C. A.). **A new species of Microsporum.**—*Mycologia*, 48, 4, pp. 613-614, 2 figs., 1956.

As two strains of *Microsporum gypseum* var. *nana* [2, No. 1097] have remained stable in their gross and microscopic characters for three years at the School of Medicine, Havana, Cuba, and the macroconidia differ fundamentally from those of *M. gypseum*, the organism is regarded as a new species and is named *M. nanum*.

2153. JOE (L. K.), ENG (N.-I. T.), POHAN (A.), VAN DER MEULEN (H.), & EMMONS (C. W.). **Basidiobolus ranarum as a cause of subcutaneous mycosis in Indonesia.**—*Arch. Derm., Syph., Chicago*, 74, 4, pp. 378-383, 12 figs., 1956.

The authors present from the School of Medicine, University of Indonesia, a detailed clinical and mycological account of an infection of a four-year-old boy by *Basidiobolus ranarum*. The lesion, which began as a small subcutaneous nodule six months before admission to hospital, developed rapidly in that time to become a swelling involving the entire left pectoral region. One week before admission the overlying skin became bluish-red. The swelling was caused by a disc-shaped granuloma, 1.5 cm. thick, with thinner edges, replacing the subcutaneous adipose tissue. The edges of the granuloma were sharply

demarcated, and it was not adherent to the underlying fascia. The patient's condition was otherwise good and there was no swelling of the regional lymph nodes. Biopsy sections of the granuloma, fixed in formalin and stained with haematoxylin and eosin, revealed sparse thin-walled hyphae 8–22 μ in diameter with no obvious septa.

In culture on Sabouraud's agar flat, glabrous colonies developed rapidly, reaching a diameter of 7 cm. in four days at 30° C. Septation was more frequent than in *Mucor*, and enormous numbers of chlamydospores and characteristic zygosporos were present.

Another case is presented of a boy who was admitted to hospital at eight years of age with lesions closely corresponding to those described except that they were more extensive and that the overlying skin was only slightly cyanotic.

No diagnosis was made at the time, though biopsies were performed, and the patient was released without treatment. The present authors made the diagnosis two years later from the presence of hyphae in the original biopsy material and from the general similarity to the case described above. Recalled to the hospital the patient was found to have made an almost complete recovery.

Of the two remaining swellings one, on the right buttock, was removed surgically. No hyphae were present, perhaps because the lesion was healing. The other, on the left buttock, was not removed and later disappeared.

Reference is made to a paper by VAN OVEREEM (*Bull. Jard. bot., Buitenz.*, Sér. III, 7, pp. 423–431, 1925), reporting a granulomatous disease of a horse, in which *B. ranarum* was isolated from fungus granules obtained from draining sinus tracts in the lesion.

2154. MCGILL (H. C.) & BRUECK (J. W.). **Brain abscess due to *Hormodendrum* species. Report of third case.**—*Arch. Path.*, 62, 4, pp. 303–311, 7 figs., 1956.

A fatal case of brain abscess in a woman aged 37, caused by *Hormodendrum* sp. (probably the *Cladosporium trichoides* of other authors [cf. 2, No. 1763]) is reported from the Louisiana State University of Medicine. There were no lesions elsewhere in the body, and haematogenous spread from a superficial wound is presumed to have occurred.

2155. VERTINSKY (K. I.). Токсическая диспепсия и дизентерия Поросят. [Toxic dyspepsia and dysentery in Piglets.]—*Veterinariya, Moscow*, 33, 1, pp. 14–22, 4 pl., 1956.

At the Moscow Veterinary Academy, U.S.S.R., toxic dyspepsia and dysentery in piglets, both of which are described, were shown to be one and the same disease and to be of fungal origin. The fungus responsible has not yet been identified but it is proposed to describe the disease, provisionally, as blastomycotic dysentery. For the present the authors recommend attention to general hygiene and the use of biomyacin [route not stated] on pig farms.

2156. LACAZ (C. DA S.) & NETTO (C. F.). **Contribuição para o estudo dos agentes etiológicos da maduromicose.** [Contribution to the study of the aetiological agents of maduromycosis.]—*Folia clin. biol., S. Paulo*, 21, 5, pp. 331–352; 6, pp. 411–432; 22, 5–6, pp. 301–337, 24 figs., 1954. [*T.D.B.*, 54, p. 86.]

The authors present a detailed and critical review of maduromycosis (as distinguished from nocardial mycetoma) with special attention to the etiological status, taxonomy, and nomenclature of 38 species of fungi alleged to be capable of producing the condition in man.

The following are accepted as good species and authentic causes of mycetoma: *Allescheria boydii* (*Monosporium apiospermum*), *Madurella tozeuri* (*M. mycetomi*), *M. grisea*, *Cephalosporium recifei*, *C. falciforme*, *Aspergillus amstelodami*, *A. nidulans*, *A. fumigatus*, *Acremonium potronii*, *Acremoniella lutzi*, and *Phialophora jeanselmei*. It is concluded that *Monilia*, *Mortierella*, *Penicillium*, and *Mucor* occur merely as contaminants; that *Indiella* is a *nomen dubium et confusum*; that *Glenospora*, in reports on mycetoma, is difficult to characterize from the poor descriptions presented; that *Aspergillus bouffardi* and *A. mycetomi* are not valid species; and that identification of the causative fungi must be based on their morphology in culture.

They consider that 'visceral mycetoma' should be accorded more attention. The instances of this condition which they quote were all of pulmonary localization and caused by *Aspergillus* species.

2157. KAKOTI (L. M.) & DEY (N. C.). **Mycetoma caused by *Glenospora semoni*.**—*Indian J. med. Sci.*, 10, 11, pp. 889–891, 8 figs., 1956.

The morphological and cultural characters of a fungus isolated at the Assam Medical College, Dibrugarh, from the tumefied right foot of a 22-year-old male native of Rajputana resembled those of *Glenospora semoni* [1, No. 1727], to which infection is accordingly attributed.

2158. VANBREUSEGHEM (R.), COURTOIS (C.), THYS (A.), & DOUPAGNE (P.). **Deux cas de mycétomes congolais par *Nocardia brasiliensis*.** [Two cases of mycetoma caused by *Nocardia brasiliensis* in the Congo.]—*Ann. Soc. belg. Méd. trop.*, 36, 4, pp. 479–487, 10 figs., 1956.

Following their earlier description of nine cases of mycetoma in the Belgian Congo [2, No. 1078], in none of which the characteristic swelling of the plantar surface was seen, the authors here report two cases, both caused by *Nocardia brasiliensis*. One, in a man of 30, was noteworthy in that the characteristic plantar swelling was again absent, and the other, in a woman of 50, in that the knee was affected. There is no previous record of such infection of the knee in the Belgian Congo.

2159. VANBREUSEGHEM (R.). **À propos d'une souche de *Madurella grisea* Mackinnon 1949 isolée au Congo Belge.** [On an isolate of *Madurella grisea* Mackinnon 1949 from the Belgian Congo.]—*Ann. Soc. belg. Méd. trop.*, 36, 4, pp. 467–478, 4 figs., 1956.

The author gives a detailed description of the cultural characteristics of a strain of *Madurella grisea* isolated from a case of mycetoma in the Belgian Congo. Production of sclerotia was favoured by glucose, saccharose and maltose, and was more abundant with the first two when the volume of the medium (agar-bacteropeptone Difco) was restricted.

The essential characters are outlined for the diagnosis of *M. grisea* and *M. mycetomi* [cf. 2, No. 1727].

2160. NEGRONI (P.) & DAGLIO (C. A. N.). **Primer caso sudamericano de maduromicosis por *Madurella tabarkae*.** [First South American case of maduromycosis caused by *Madurella tabarkae*.]—*Rev. Inst. bact.*, B. Aires, 16, 2, pp. 133–138, 1 fig., 1954. [English summary.]

The first case of maduromycosis with black grains caused by *Madurella tabarkae* is reported for Argentina. The patient was a 29-year-old woman from Santiago del Estero and infection was localized on the left knee.

[This paper also appears in *Rev. Asoc. bioquím. argent.*, 20, 101, pp. 305–310, 1955.]

2161. RÖTTGER (H.). **Nagelmykose als Ursache einer Arthritis der kleinen Finger- und Zehengelenke.** [Onychomycosis as cause of an arthritis of the little finger and toe joints.]—*Münch. med. Wschr.*, 98, 15, pp. 538–543, 5 figs., 1956. [English and French summaries of two lines each.]

From the Rheumatic Research Institute, Bad Elster, Germany, the author reports a case of onychomycosis in a 38-year-old man who contracted the infection, which developed into arthritis destruens of the little finger and toe joints, during captivity as a prisoner-of-war in France. *Trichophyton tonsurans* was isolated from the nail bed but could not be detected in the joints. A few foci were also present in the scalp.

2162. LA TOUCHE (C. J.). **Onychomycosis in Cats infected by *Microsporum canis* Bodin.**—*Vet. Rec.*, 67, pp. 578–579, 8 figs., 1955.

From the University of Leeds the author describes four cases (one of which was first reported in 1953 [2, No. 604]) of onychomycosis in cats due to *Microsporum canis*. The infected claws fluoresced under Wood's light. The whitish opacities (leuchonychia) seen in daylight and reported previously were probably due in part to *Aspergillus terreus* which was associated with *M. canis* in the superficial layers. Varying degrees of leuchonychia were also found in a few claws not infected with *M. canis*. Mycelium was shown to penetrate to all levels of the keratin layer. The main hyphae were branched sparingly and ran parallel to the long axis of the claw, with anastomoses occurring between them. Some mosaic patches of spores occurred in the surface layers. All of the cats had infected fur also, and the isolates from the claws corresponded to those from the fur. They included one eugonic non-pigmented strain and three eugonic pigmented strains, of *M. canis*.

2163. GRIGORAKI (L.). **Les champignons parasites de teignes.** [The parasitic fungi causing tinea.]—*Mycopathologia*, 7, 3/4, pp. 291–320, 12 pl., 1956.

After a discussion of research on dermatophytes by workers of the French School over the period from 1837 to 1935 the author reviews his own contributions and conclusions [see next entry].

2164. GRIGORAKI (L.). **Histoire et diagnostic des dermatophytes.** [History and diagnosis of the dermatophytes.]—*Ann. Derm. Syph., Paris*, 82, 4, pp. 388–399, 1955.

This is a recapitulation of the author's studies [see preceding entry] on the clinical and botanical history, morphology, cytology, and taxonomy of the dermatophytes, which formed the basis of his system for their classification [*Rev. appl. Mycol.*, 4, p. 736].

2165. LUTZ (W.). **Mykosen.** [Mycoses.]—*Dermatologica, Basel*, 111, 3, pp. 161–167, 1955.

This review of contemporary literature on human mycoses deals mainly with the dermatophytes, but brief references to actinomycoses and generalized fungal infections are also included.

2166. PFISTER (R.). **Über die Häufigkeit der Pilzerkrankungen in Südwestdeutschland: Ein Vergleich mit den epidemiologischen Verhältnissen in den Jahren 1931, 1935–1937, 1947–1954.** [Incidence of fungal diseases in south-west Germany. A comparison of the epidemiological conditions in 1931, 1935 to 1937, 1947 to 1954.]—*Z. Haut- u. Geschlechtskr.*, 20, 9, pp. 259–264, 1956.

This is a tabulated survey and discussion of the incidence of dermatomycoses at the University Skin Clinic, Freiburg, in the years mentioned in the

title. A striking feature is the increase in frequency, specially of epidermophytoses (*Epidermophyton* spp.), from 1948 to 1952. This group accounted for over 70 per cent. of the cases treated from 1950-54, inclusive, as compared with 1 per cent. in 1931. Trichophytoses (*Trichophyton* spp.) were specially prevalent during the period 1947-49. Microsporoses (*Microsporum* spp.) are unimportant locally, while favus [*T. schoenleini*] had not been encountered for 25 years until 1951-53, when four cases were seen.

2167. SIMUANGCO (S. A.). **Status of fungus diseases in the Philippines.**—*J. Phil. Is. med. Ass.*, 32, 4, pp. 201-206, 1956.

Systemic moniliasis caused by *Candida albicans* (*Amer. J. trop. Med. Hyg.*, 2, pp. 655-657, 1953) is responsible for vaginal infection during pregnancy. Three cases of Madura foot are on record, *Nocardia* spp. having been isolated in two. *N. asteroides* was isolated at autopsy from a lung abscess in a four-month-old female infant (*J. Philipp. med. Ass.*, 12, pp. 11-24, 1932), and three other cases of pulmonary nocardiosis have been reported without cultures. One case of chromoblastomycosis (*Hormodendrum compactum*) [*Phialophora compacta*] has been encountered (ibid., 30, pp. 117-120, 1955), and one of rhinosporidiosis [*Rhinosporidium seeberi*] (*Philipp. J. Sci.*, 38, pp. 437-441, 1929).

The superficial mycoses are the principal mycological problems in medical practice. During the period from 1952 to 1954 the number treated at the Skin Dispensary, Manila, was 3,361 compared with only 11 of the deep form. Tinea pedis, caused mostly by *Trichophyton mentagrophytes* [1, No. 2494; 2, No. 392], was the most prevalent (958 or 28.5 per cent.), followed by tinea circinata (677 or 20.14), tinea cruris (545 or 16.22), tinea manum (530 or 15.77), and tinea flava (519 or 15.44). *T. rubrum* [loc. cit.] appears to be the predominant agent of tinea circinata, tinea cruris, tinea manum, and tinea unguium (57 or 1.69). *Epidermophyton* and *Microsporum* spp. rarely occur in the Philippines.

2168. **Animal reservoir of ringworm infection in Britain.**—*Brit. med. J.*, 1, pp. 963-965, 1956.

This paper is a report of the Medical Mycology Committee to the Medical Research Council. It is pointed out that the greater part of human ringworm infection derives from the reservoir of animal infection, and reference is made to the work of Mortimer in East Anglia [2, No. 1655] who found that about fifteen per cent. of 2,000 cattle under study were infected. Farmers are apathetic, finding the cost of treatment high and often believing that sunlight and pasture will effect a natural cure. Reference is also made to the work of La Touche [see next entry] in Leeds, where teamwork between school and medical authorities, the public health service, and the mycological diagnostic unit at Leeds Infirmary led to the tracking down and cure of dogs and cats harbouring *Microsporum canis*. A decrease of human infection followed this work, and was thought to be the result of it. A good diagnostic service is fundamental to ringworm control, and arrangements have been made to supplement existing services by setting up facilities for mycological diagnosis at the regional laboratories of the Public Health Laboratory Service and at the 19 veterinary investigation centres of the Ministry of Agriculture and Fisheries.

2169. LA TOUCHE (C. J.). **The importance of the animal reservoir of infection in the epidemiology of animal-type ringworm in Man.**—*Vet. Rec.*, 67, pp. 666-667, 5 maps, 5 graphs, 1955.

The author discusses the economic importance and problems of eradication

of ringworm fungi transmitted to man from cattle (*Trichophyton verrucosum* var. *discooides* and *T. mentagrophytes*) and cats and dogs (*Microsporum canis*). Special reference is made to experiments in progress in Leeds (1, No. 2511) where the campaign to eliminate the animal reservoir of *M. canis* has been the major factor in bringing about a considerable decrease in the incidence of infection in man. During the period 1950–1954 the total number of infections found was 29 in cats, six in dogs, and 146 in human family groups (226 individuals).

2170. SELLERS (K. C.), SINCLAIR (W. B. V.), & LA TOUCHE (C. J.). **Preliminary observations on natural and experimental ringworm in Cattle.**—*Vet. Rec.*, 68, pp. 729–732, 16 figs., 1956.

In studies at the Veterinary Investigation Centre, Leeds, and at the Leeds General Infirmary experimental lesions closely resembling natural ones were produced in calves by rubbing material from natural lesions or culture suspensions lightly into sites prepared by clipping the hair on parts of the body which could not be disturbed by the animal.

Biopsy specimens indicated that infection was a gradual process of invasion of the keratinized layers of the skin and the hair follicles. From their findings and from field observations the authors suggest that the concentration of animals in an infective environment, natural healing processes, dietary inadequacies, and resistance (immunity) are all concerned in the epidemiology of the disease.

2171. MENGES (R. W.) & GEORG (LUCILLE K.). **Observations of feline ringworm caused by *Microsporum canis* and its public health significance.**—*Proc. Meet. Amer. vet. med. Ass.*, 1955, pp. 471–474, 1955.

In an outbreak of *Microsporum canis* infection affecting 40 cats and one dog at a cat-breeder's home in Georgia only 24 of the cats had lesions. Material from a total of 148 cats from various parts of the U.S.A., including the 40 mentioned above, was examined in the course of a ringworm survey. *M. canis* was present in 82 cases. The authors suggest that cat-breeding establishments should be examined by local public health departments, sales being permitted only when the stock was certified free from ringworm.

2172. GIERLØFF (B. C. H.). **Om microspori, specielt hos Hund og Kat.** [*Microsporum* infection, particularly in Dogs and Cats.]—*Nord. VetMed.* 8, pp. 609–631, 1956. [English and German summaries. *V.B.*, 27, No. 71.]

Microsporum canis was isolated from four of 11 dogs and both of two cats suspected of having transmitted the infection to human contacts. A bitch inoculated at a scarified site on the inner thigh with material from a dog lesion developed similar lesions which later spread over the body. Six puppies born to the bitch were all clinically infected at five weeks of age.

2173. SANDERINK (J. F. H.) & MALI (J. W. H.). **Enige waarnemingen aangaande de epidemiologie van animale microsporie bij de Mens, met Katten als bron van infectie.** [Some observations concerning the epidemiology of animal microsporiasis in Man, with Cats as the source of infection.]—*Ned. Tijdschr. Geneesk.*, 100 (iv), 50, pp. 3692–3697, 4 figs., 1956. [English summary.]

From the Academic Hospital, Groningen, the Netherlands, the author reports in detail on two small-scale epidemics of tinea capitis caused by *Microsporum felinum* [*M. canis*]. Cats were the source of infection in both.

2174. GUILHON (J.) & CHAUVIER (G.). **Teigne du Mouton.** [Tinea of the Sheep.]—*Rapp. Commun. VIIIe Congr. int. Bot.*, 1954, Sect. 18–20, pp. 124–125, 1954.

In this brief paper from the École Nationale Vétérinaire d'Alfort, the authors describe the symptoms of tinea in sheep, noting that *Trichophyton pruinosum*, *T. discoides* and *Ctenomyces granulatus* [*T. granulatum*] can cause the condition.

2175. PIREDDA (A.). **Della produzione di anticorpi antiifomicetici da parte della cute umana.** [On the production of anti-hyphomycetous antibodies by the human skin.]—*G. ital. Derm. Sif.*, 96, 5, pp. 527–535, 1955. [French, English, and German summaries.]

At the Dermatological Clinic of the University of Ferrara the author studied the complement-fixation reactions with a polyvalent antigen extracted from *Trichophyton* and *Microsporum* spp. in cantharidated blister fluid and in the blood serum of 21 patients with superficial, non-suppurating dermatomycoses. There were no non-specific reactions, and in positive subjects the reaction was consistently more intense in the blister fluid than in the serum, presumably owing to a more extensive antibody production in the cutaneous than in other tissues.

2176. SKINNER (C. E.) & HUXLEY (M. JOAN). **Rhodotorula glutinis.**—*Mycologia*, 48, 3, pp. 371–377, 1 fig., 1956.

The authors classified 99 isolates of *Rhodotorula* by the method of Lodder and Kreger-van Rij (The yeasts—a taxonomic study, Amsterdam, North Holland Publishing Company, 1952), which rests primarily on the ability of species to utilize five simple sugars as sole sources of carbon, and potassium nitrate as a sole source of nitrogen.

Using Wickerham's methods (Taxonomy of yeasts, *Tech. Bull. U.S. Dept. Agric.*, 1029, 1951) they then studied 21 other organic compounds and several other physiological characteristics of the isolates, concluding from their findings that other systems of classification could be devised, as logical, practical, and 'natural' as that of Lodder and Kreger-van Rij, but leading to a different allocation of isolates into species. They conclude also that size and shape are unreliable characters for classifying *Rhodotorula* spp.

In the absence of decisive work proving that any one system is the natural one they consider that the genus should be regarded as monotypic.

2177. BIGUET (J.), COCHET (G.), DOBY-DUBOIS (M.), MULLET (S.), & DEBLOCK (S.). **Trichophyton glabrum Sabouraud 1910 Peut-il être considéré comme une variété fixe de T. violaceum Bodin 1902?** [Can *Trichophyton glabrum* Sabouraud 1910 be considered as a stable variety of *T. violaceum* Bodin 1902?]
—*Ann. Parasit. hum. comp.*, 31, 4, pp. 470–475, 1956.

The authors report a study of 98 smooth strains of *Trichophyton* which had developed no pigmentation after two months at 28° C. on glucose Sabouraud medium, and which could therefore have been named *T. glabrum*. Nineteen of these cultures developed violet pigment in the following nine months, and twelve of the remainder did so in subculture, eight within a month of transfer.

They conclude that *T. glabrum* cannot stand as a distinct species, or as a variety of *T. violaceum*, but must be reduced to synonymy with the latter.

2178. GEORG (LUCILLE K.). **Studies on Trichophyton tonsurans. I. The taxonomy of T. tonsurans.**—*Mycologia*, 48, 1, pp. 65–82, 2 pl., 1956.

After an historical review of papers on the taxonomy of *Trichophyton tonsurans* the author describes studies carried out at the Communicable Disease

Center, Chamblee, Georgia, on single spore cultures of 13 recent isolates from hair and 12 named 'species' from several culture collections. All of these fungi belonged to the 'crateriform' group. It was demonstrated that all were unstable morphological variants of a single species. The observation that all had a similar partial deficiency for thiamine was taken as further evidence of their common identity.

2179. GEORG (LUCILLE K.). **Studies on *Trichophyton tonsurans*. II. Morphology and laboratory identification.**—*Mycologia*, 48, 3, pp. 354–370, 10 figs., 1956.

Continuing her studies on *Trichophyton tonsurans* [2, No. 1425], the author describes the morphology of the fungus in hair, skin, and nails, and in culture. The gross morphology of the colony and the microscopic morphology of young and old cultures are presented in detail, and a test is described, based on the marked improvement of growth on vitamin-free casein agar in the presence of thiamine [see preceding and next entries], which may be used either to identify atypical strains or to confirm the identity of typical strains.

2180. MIGUENS (M. P.). **Contribución al estudio de la biología de los dermatofitos.—El auxanograma de nitrógeno.** [Contribution to the study of the biology of dermatophytes.—The nitrogen growth picture.]—Reprinted from *Arch. Inst. Farmacol. exp. (Med.)*, 8, 1–2, 34 pp., 24 figs., 1956.

At the Institute of Experimental Pharmacology, Salamanca, Spain, the authors studied the growth of eleven species of *Trichophyton*, three of *Microsporum*, and *Epidermophyton floccosum* under varying conditions of nitrogen nutrition. *T. verrucosum* and certain strains of *T. tonsurans* needed thiamine, pyridoxine and inositol for good growth. *T. megnini* and *T. violaceum* grew only in the presence of peptone, a finding which is especially useful in the identification of the former.

T. rubrum, *T. mentagrophytes*, *T. quinckeanum*, and *T. gallinae* were stimulated by urea in concentrations up to 1 in 1,000, while 1 in 100 was inhibitory.

2181. FUJII (T.). **Biochemical studies on pathogenic fungi. IV. Submerged culture for the respiratory study of dermatophytes.**—*Pharm. Bull. (Japan)*, 3, pp. 423–426, 1955. [Abs. in *Chem. Abstr.*, 50, 20, col. 14859, 1956.]

At the Gifu Prefecture Medical School submerged culture of *Trichophyton gypseum* [*T. mentagrophytes*], gave a very fine mycelial suspension, thereby facilitating quantitative handling as early as four days after inoculation. Suspensions thus obtained showed a shorter lag phase in the oxidation of glucose than slices or bored disks of the mycelial pad produced by surface growth; were permeable to many substrates which did not appear to be oxidized by the surface-pad preparation; and were sensitive to respiratory inhibitors like cyanide, azide, iodoacetate, and arsenite.

2182. POLEMANN (G.). **Zur Methodik der Respirationsuntersuchungen bei *Microsporon gypseum* mittels der Warburg-Apparatur.** [On the technique of studies on respiration in *Microsporon gypseum* with the aid of the Warburg apparatus.]—*Arch. klin. exp. Derm.*, 204, 1, pp. 70–73, 1957.

The procedure for the study of *Microsporon gypseum* as a test organism in the Warburg respirometer is described from the University Skin Clinic, Cologne.

2183. FEGELER (F.). **Cycloheximid-(actidion)-agar, ein Fortschritt in der Züchtung von Dermatophyten.** [Cycloheximide (actidione) agar, an advance in the

culture of dermatophytes.]—*Dermatologica, Basel*, 113, 2, pp. 65–70, 3 figs., 1956. [English and French summaries.]

On the basis of experience at the University Skin Clinic, Münster, Germany, the author strongly recommends the use of actidione agar [2, No. 1145] for the culture of dermatophytes, including *Trichophyton faviforme* [*T. verrucosum*], the most prevalent agent in Westphalia of cattle ringworm.

2184. PINETTI (P.) & SPADA (C.). **L'attività proteolitica di *Trichophyton violaceum* ed il suo comportamento in rapporto con la variabilità del micete sui terreni artificiali di cultura.** [The proteolytic activity of *Trichophyton violaceum* in relation to the variability of the fungus on artificial culture media.]—*Boll. Soc. ital. Biol. Sper.*, 31, 7–8, pp. 1031–1033, 1955.

In studies conducted at the Istituto di Clinica Dermosifilopatica, University of Cagliari, Sardinia, the authors compared the proteolytic activities of seven recently isolated, typical strains of *Trichophyton violaceum* and 23 older, atypical strains displaying various modifications in their pigmentation and morphology. All induced partial or total liquefaction of gelatin.

Of the strains with typical pigmentation, 35.2, 41.3, and 23.5 per cent. showed, respectively, weak, medium, and intense proteolytic activity, the corresponding figures for the strains with modified pigmentation being 15.4, 61.6, and 23 per cent. The figures for the morphologically typical strains were 14.3, 42.9, and 42.8 per cent., and for those with modified morphological characters 26, 52.2, and 21.8 per cent.

2185. SPADA (C.). **Ulteriori ricerche sulle influenze reciproche esercitate sulla loro crescita da diversi stipiti di dermatomiceti.** [Further researches on the reciprocal influences exerted on growth by various strains of dermatomycetes.]—7 pp., 1 fig., Clinica dermatosifilitica dell' Università di Cagliari, 1955.

At the University of Cagliari, Sardinia, each of five dermatophytes (*Trichophyton tonsurans*, *T. violaceum* [2, Nos. 398, 406], *Achorion* [*T.*] *schoenleini*, *Microsporum canis*, and *Epidermophyton floccosum*) was grown in five media incorporating, respectively, culture filtrates (untreated or heated at 100° C. for five minutes) obtained from the five organisms.

The results are tabulated. Heating slightly reduced the inhibitory action of the filtrates in 27 per cent. of the tests.

2186. PINETTI (P.). **Influenze inibitrici esercitate da alcuni dermatofiti sulla reazione tirosina-tirosinasi.** [The inhibiting effects exerted by some dermatophytes on the tyrosine-tyrosinase reaction.]—Reprinted from *Atti Soc. ital. Derm. Sif.*, 30, Suppl. 12, 4, 6 pp., 1955.

In preliminary studies at the University of Cagliari, Sardinia, of the effect upon the tyrosin-tyrosinase reaction [2, No. 1392] of 17 strains of new and old cultures of *Epidermophyton floccosum*, *Trichophyton schönleini*, *T. mentagrophytes*, *T. epilans*, *T. megnini*, *T. tonsurans*, *T. violaceum*, *Microsporum canis*, and *M. audouini*, 35 per cent. of all the strains produced total or partial permanent inhibition of the reaction; 53.2 per cent. retarded it; and 11.8 per cent. had no effect. Half the strains of *Epidermophyton*, almost all the strains of *Trichophyton*, and all the strains of *Microsporum* had some effect. In general, recently isolated strains were more frequently and more strongly active than older strains.

2187. URI (J.), JUHÁSZ (P.), & CSOBÁN (G.). **Über die Penicillinbildung von *Trichophyton-mentagrophytes*-Stämmen.** [On penicillin production by *Trichophyton mentagrophytes* strains.]—*Pharmazie*, 10, 12, pp. 709–713, 6 figs., 1955.

At the Pharmacological Institute, Debrecen, Hungary, 15 out of 20 strains of *Trichophyton mentagrophytes* of human origin showed penicillin-like antagonistic properties on solid culture media. The active substance secreted from 10 strains into the liquid medium of shake cultures exerted a powerful action against *Micrococcus pyogenes* var. *aureus* [*Staphylococcus aureus*], *Bacillus subtilis*, and *Escherichia coli*. It was virtually inactivated by penicillase and extensively weakened under the influence of acids, alkalies, heat, and copper ions.

It was demonstrated by means of paper chromatography that the active principle produced by the fungus strain without administration of a precursor consists mostly of penicillins G and X. The former is obtainable in the usual way as *N*-ethylpiperidine salt from the fermentation liquid of deep cultures. The T-6 strain was found to secrete 60 to 100 units of penicillin G per ml. The addition to the cultures of a penicillin precursor, phenyl acetate, resulted in a fivefold increase in production.

It is suggested that these data may contribute to an elucidation of the relationship between *Trichophyton* and *Penicillium*. Moreover, they may help to explain the frequent hypersensitivity to penicillin of persons suffering from mycoses.

2188. MALLINCKRODT-HAUPT (A. S.) & GELDMACHER-MALLINCKRODT (M.). **Die Isolierung der Antibiotika aus pathogenen Hautpilzen.** [The isolation of antibiotics from pathogenic dermatophytes.]—*Mycopathologia*, 7, 3/4, pp. 261-268, 1 fig., 1956.

In a study at the Skin Clinic, Brühl, Cologne, Germany, ether-soluble substances possessing activity principally against 'Coli' [*Escherichia coli*] were obtained from *Microsporum audouini* and *M. gypseum*. Strains of the Kaufmann-Wolf fungus [*Trichophyton interdigitale*] produced an ether-soluble substance active against *Actinomyces*. *Trichophyton granulosum* [*T. mentagrophytes*] and *Trichophyton rosaceum* [*T. megnini*] produced substances soluble in isobutanol or acetic acid and active principally against *Actinomyces*. Chemical studies of these antibiotics are reported.

2189. BOWDEN (J. P.) & SCHANTZ (E. J.). **The isolation and characterization of dermatitic compounds produced by *Myrothecium verrucaria*.**—*J. biol. Chem.*, 214, 1, pp. 365-372, 2 graphs, 1955.

The authors describe the culture of *Myrothecium verrucaria* on a modified AS medium with initial pH adjusted to 4.0, and the extraction of dermatitic substances including a white crystalline dermatitic substance of molecular formula $C_{15}H_{22}O_4$, the properties of which are described.

2190. JANKE (Frau R. G.) & LUGER (A.). **Seltene Mykosen.** [Rare mycoses.]—*Arch. Derm. Syph., Wien*, 200, pp. 436-440, 1955.

The three unusual cases of dermatomycosis reported at the 22nd meeting of the German Dermatological Society at Frankfurt-am-Main on 19th September, 1953, involved patients at the University Dermatological Clinic, Vienna. The first, in a 41-year-old woman, was characterized by itching, circular lesions, ranging in size from a coin to the palm of the hand and composed of lenticular nodules, on the trunk and extremities. Isolations from the tissues yielded *Candida pelliculosa* [I, No. 750] and *Rhodotorula rubra* [2, No. 1969].

The species associated with generalized prurigo in a 69-year-old woman was *C. guilliermondii*. The skin in the affected areas was bright or livid red and contained blisters and pustules encrusted with blood. In both these cases the results of cutaneous tests and serological studies indicated connexions between the clinical picture and the fungi cultured from the infected tissues. Iodide

medication proved helpful in the latter case, but the former was refractory to all forms of treatment applied except X-ray irradiation.

The third patient, a 58-year-old farmer, was suffering from typical eczema cruris, with which a saprophytic fungus isolated from the squamae, a species of *Hormiscium*, had no apparent causal connexion.

2191. JANKE (D.) & ROOS (G.). **Durch Aleurismaarten verursachte Dermatophytien.** [Dermatophytoses caused by *Aleurisma* species.]—*Z. Haut- u. Geschlechtskr.*, 19, 4, pp. 105–108, 3 figs., 1955.

Aleurisma carnis was isolated from 30 patients suffering from various forms of dermatophytosis at the University Skin Clinic, Marburg a.d. Lahn, Germany, during 1951–2 [1, No. 2324]. In 11 cases it was isolated in pure culture and is presumed to have been the causal organism, while in the others it was associated, probably as a saprophyte, with various bacteria, including *Staphylococcus aureus*. Three variants of *A. carnis* developed on peptone-malt agar—orange-red, citron-yellow, and grey-white to greenish.

2192. WALTHER (H.). **Beitrag zum Erythema nodosum mycoticum.** [A contribution to erythema nodosum mycoticum.]—*Z. Haut- u. Geschlechtskr.*, 19, 7, pp. 203–205, 3 figs. on pl. xxvii, 1955.

In connexion with the prevalence of epidermophytosis of the feet in Germany [see below, Nos. 2200, 2202], the author reports a case of long-standing atypical erythema nodosum associated with this condition in a 56-year-old woman. Topical applications of multifungin (bromosalicyl-chloranilide-soventol) [2, No. 1972] effectively combated the fungal infection and the erythema nodosum subsided without further treatment.

2193. GRIMMER (H.). **Stellungnahme zur Arbeit von H. Walther in dieser Zeitschrift: Beitrag zum Erythema nodosum mycoticum.** [Attitude to H. Walther's article in this journal: Contribution to erythema nodosum mycoticum.]—*Z. Haut- u. Geschlechtskr.*, 19, 10, pp. 304–307, 3 figs., 1955.

Arguments are advanced and supplemented by the author's observations at the skin clinic of the Free University, Berlin, in support of his contention that Walther's supposed case of erythema nodosum mycoticum [see preceding entry] was actually one of follicular trichophytosis.

2194. TORHEIM (B. J.) & HENRIKSEN (S. D.). **A case of trichophytia simulating furunculosis.**—*Acta path. med. scand.*, 39, 5, pp. 353–356, 5 figs., 1956.

From the Wilhelmsen Bacteriological Institute, Oslo, Norway, the authors report a case of infection by *Trichophyton mentagrophytes* involving the calves of both legs in a 19-year-old girl resident in a rural area. The fungus was also isolated from the finger- and toe-nails, the latter in particular being porous and deformed, suggesting that they were the original site of infection. The deep-seated lesions, leaving solid infiltrations and scars in the skin, resembled furuncles and antibiotic therapy had accordingly been applied for about two years.

2195. VANBREUSEGHEM (R.) & VAN WYMEERSCH (H.). **Herpès circiné par Trichophyton rubrum chez un Enfant de 8 mois.** [Tinea circinata caused by *Trichophyton rubrum* in a Child of eight months.]—*Ann. Soc. belge Méd. trop.*, 36, 4, pp. 487–492, 2 figs., 1956.

The authors report a case of *Trichophyton rubrum* infection of the lower back and buttocks of an eight-month-old child at Léopoldville, Belgian Congo, probably contracted from the mother. This is apparently the second reported case of this infection in early childhood [cf. 2, No. 893].

2196. VANBREUSEGHEM (R.), GHISLAIN (E.), & WELLENS (W.). **Signification de l'isolement d'une souche de 'Keratinomyces ajelloi' Vanbreuseghem 1952 a partir de l'homme.** [The significance of the isolation of *Keratinomyces ajelloi* Vanbreuseghem, 1952, from Man.]—*Arch. belges Derm.*, 12, 2, pp. 130–134, 1956.

Following the isolation of *Keratinomyces ajelloi* [cf. 2, No. 1679] from a squamous erythematous lesion on the leg of an agricultural labourer at the Hôpital Saint Pierre, Louvain, Belgium, the same organism was isolated by the use of hair baits from the soil of a field in which he had been working [cf. *Ann. Soc. belge Méd. trop.* 32, 2, pp. 173–178, 1952]. Attempts to produce skin infections on a volunteer with this and another soil isolate were unsuccessful. It seems that the isolate from the lesion was a contaminant.

2197. GENTLES (J. C.). **The isolation of dermatophytes from the floors of communal bathing places.**—*J. clin. Path.*, 9, 4, pp. 374–377, 2 figs., 1956.

The author describes from the Mycology Section, Department of Bacteriology, Glasgow University, an apparatus for sampling the floors of shower rooms for the presence of dermatophytes. Within the lid of a cylindrical tin is mounted a wooden stem bearing a mushroom-like cap of wood covered with velvet over a padding of non-absorbent cotton wool. This sampler is autoclaved within the tin. In use it is pressed firmly against the floor with a slight twist and then replaced in the tin. Each sampler is used to inoculate three plates, the soiled patch being pressed lightly against the surface of the agar.

Trichophyton mentagrophytes or *T. rubrum* were isolated from the floors of all five communal bathing-places examined.

2198. HOLMES (J. G.) & GENTLES (J. C.). **Diagnosis of foot ringworm.**—*Lancet*, 271, 6993, pp. 62–63, 1956. [*B.H.*, 32, p. 1007.]

The authors emphasize that diagnosis of tinea pedis can only be made where a clinical disorder of the skin or toe-nails is associated with the presence of a dermatophyte, neither alone being sufficient.

In illustration of this they quote the results of a survey based on independent clinical and mycological examinations of the feet of over 2,000 men employed in coal mines and in electrical generating plants. Of these, 90·5 per cent. had some clinical disorder of the skin, while mycological examination (by culture in 93 per cent. and microscopy in the remainder) revealed the presence of dermatophytes [unspecified] in only 21 per cent. The more significant lesions were: vesicles, in all stages (75 per cent. infected); fissures or dermatitis (48 per cent.); erythema, with or without raw areas or fissures (22 per cent.); maceration or peeling, or both (7·5 per cent.).

In all clinical groups there was a higher rate of infection in those who used communal baths than those who did not.

2199. POLEMANN (G.). **Zur Häufigkeit von Fußmykosen bei Jugendlichen.** [Concerning the frequency of foot mycoses in Young People.]—*Arch. klin. exp. Derm.*, 20, 1, pp. 24–35, 1955.

From the University Skin Clinic, Cologne, the author reports a survey of the incidence of dermatomycosis of the feet [cf. 2, Nos. 850, 1369] in children in that city, where he examined a total of 5,615 children three to eighteen years of age over the period from 1948 to 1953. Diagnosis was made on clinical grounds only. The over-all incidence for the group was 41·8 per cent., the difference between girls (38·5 per cent.) and boys (45) being statistically significant. Starting at about eight per cent. in the three-to-six-year group the incidence increased steadily with age to reach about 80 per cent. in the 17–18 year group.

2200. SCHIRREN (C.), REITH (H.), PINGEL (J. C.), & HANSEN (P.). **Dermatophytenflora eines Industriebetriebes unter besonderer Berücksichtigung der Identifizierungsmethode für Dermatophyten.** [Dermatophyte flora of an industrial concern with special reference to the method of identification for dermatophytes.]—*Arch. Hyg. Bakt.*, 140, 6, pp. 423–450, 6 figs., 1956. [English and French summaries.]

Following an introductory survey of up-to-date information on the dermatomycoses, with special reference to their continuous increase in Germany, the writers report in detail their clinical and mycological investigations on 2,110 workers in a rubber shoe factory in the Hamburg district. The methods of microscopic and cultural examination, isolation, and identification of the fungi are fully described. Kimmig's 'diagnostic' peptone-glucose-bouillon agar, supplemented by 50,000 units of penicillin and 0.05 gm. dihydrostreptomycin per l., was used for the primary isolations and final identification was based on Sabouraud's glucose and peptone agar cultures.

Of the 1,311 males examined, 1,068 (81.5 per cent.) showed clinical symptoms, mostly in the interdigital regions of the feet, the corresponding figures for females being 529 out of 799 (66.2). The nails were involved in 72 cases. *Trichophyton mentagrophytes* was isolated from 60 per cent. of the skin lesions, *T. rubrum* from 18.6, and *T. violaceum* from 18.8, while *T. verrucosum*, *T. quinckeanum*, *T. megnini*, and *Epidermophyton floccosum* were also identified. Of the dermatophytes from 17 nail lesions, 12 were identified—six as *T. mentagrophytes*, one as *T. rubrum*, and five as *T. violaceum*. [Unspecified] yeasts or yeast-like fungi occurred in 556 cases and *Cephalosporium* and *Scopulariopsis* in 122. A method was devised of impregnating the rubber shoe material with a substance which entirely prevented fungal growth.

2201. TRITSMANS (E.) & VANBREUSEGHEM (R.). **Over het voorkomen van athlete's foot bij belgische Sportbeoefenaars.** [On the occurrence of athlete's foot in Belgian athletes.]—*Belg. Tijdschr. Geneesk.*, 11, 13, pp. 625–633, 1955.

In this work from the Provincial Institute for Hygiene and the Prince Leopold Institute for Tropical Medicine, Antwerp, the authors investigated the incidence of athlete's foot in 185 swimmers who regularly and frequently patronized indoor baths [cf. 2, No. 1684], 155 gymnasts who regularly met for training but did not take shower baths, and 170 'controls' who did not regularly follow any athletic pastime. Of the swimmers 84 (over 45 per cent.) had clinical symptoms, usually desquamation with itching, the condition being of mycotic origin in 53 (30 per cent.). Of the gymnasts 38 (24.5 per cent.) had clinical symptoms (almost exclusively desquamation with much less itching than in the swimmers), the condition being of mycotic origin in seven. Of the 'controls' 27 (16 per cent.) had clinical symptoms, fungi being present in 6 cases (3.5 per cent.). The 'control' group resembled that of the gymnasts both in the nature of the symptoms and in the incidence of infection.

Mycological diagnosis was based on microscopical examination of skin squamæ cleared in sodium hydroxide, and on culture in Sabouraud's medium: of the 50 isolates obtained 24 were *Trichophyton rubrum*, 25 *Ctenomyces interdigitalis* [*T. interdigitale*], and one was *Epidermophyton floccosum*.

The authors conclude, with Amrein [cf. 2, No. 850], that athlete's foot is a condition particularly affecting people attending public baths.

2202. BECK (F.). **Die Fußmykosen im fränkischen Raum mit Behandlungs- und Prophylaxe-Beiträgen.** [Foot mycoses in the Franconian zone with contributions to treatment and prophylaxis.]—*Z. Haut- u. Geschlechtskr.*, 19, 1, pp. 15–20, 41–50, 1955.

This is an exhaustive analysis and discussion, with numerous references to the relevant literature, of the foot and nail mycoses treated at the General Municipal Hospitals, Nuremberg, Germany, from 1949 to 1953, inclusive. The total number of cases was 740, rising from 142 in the former year to 183 in the latter. Involvement of the nails also increased during the period under review (55 and 42 cases in 1952 and 1953, respectively, as compared with nine in 1949). Carbolic acid and V741 (a Bayer preparation not yet on the market at the time of writing) were the most effective of the various remedies tested (80 per cent. cured in 20 days), followed by novex [2, No. 698] and merphen [1, No. 1985]. The problems of prophylaxis are fully considered.

2203. BARLOW (A. J. E.) & CHATTAWAY (F. W.). **Persistent fungus infections of skin, hair, and nails.**—*Lancet*, 269, 6903, pp. 1269–1271, 1955.

The present state of knowledge of the host-parasite relationship of the above-mentioned infections is reviewed. The difficulty of reaching the deeper layers in which the fungi multiply is discussed, with particular reference to the cross-linkages between keratin molecules. A scheme of treatment in which urea was used as a keratolytic in a fungicidal foot bath, followed by a spray containing ninhydrin, was applied to five cases of tinea pedis (*Trichophyton rubrum*) at the Huddersfield (Yorks.) Royal Infirmary with moderately satisfactory results, but none of the patients was completely cured after six weeks.

2204. BAER (R. L.), ROSENTHAL (S. A.), LITT (J. Z.), & ROGACHEFSKY. **II. Experimental investigations on mechanism producing acute dermatophytosis of feet.**—*J. Amer. med. Ass.*, 160, 3, pp. 184–190, 1956.

From the Skin and Cancer Unit, University Hospital, New York, it is reported that 68 volunteers whose feet were found by microscopy and culture to be free from fungi were required to immerse one foot in water infected by [unspecified] dermatophytes obtained from infected feet or from cultures. The other foot was immersed in sterile water. During a six-week follow-up period fungi were found on the feet of 37 volunteers; in 19 cases on the exposed and in five on the unexposed foot only. None of the volunteers developed clinical symptoms.

The same procedure was used for 20 volunteers whose feet harboured dermatophytes. During the follow-up period, 12 volunteers showed only the fungus which had been present before the experiment and four showed complete absence of fungi, in one case with an original infection due to *Trichophyton rubrum*. *T. mentagrophytes* was experimentally superimposed on the exposed foot, and in three cases *T. rubrum* appeared on one or both feet of patients with original infections due to *T. mentagrophytes*.

2205. FRÁGNER (P.) & SVATEK (Z.). **Mykosis kladenských havířů.** [Occurrence of mycosis among the Miners of Kladno.]—*Čsl. Epidemiol., Mikrobiol., Immunol., Prague*, 5, 2, pp. 75–82, 1956. [*B.H.*, 31, p. 1225.]

Of 1,500 underground and surface mineworkers examined at Kladno, Czechoslovakia, 884 had [unspecified] fungal infections of the interdigital clefts. Of these, 50·6 per cent. exhibited patches of macerated epidermis, 9·2 per cent. desquamation, and 40·2 per cent. other symptoms, including rhagades and hyperkeratosis. Of 553 infected persons only 65·4 experienced itching, and of 659 only 8·8 per cent. had sought medical advice. The incidence of infection bore no relation to the place or type of work, nor to the type of footwear.

A mycological study of the feet of 170 persons revealed the presence of *Candida albicans* in 130 and *Trichosporum* sp. in 22; *Sporotrichum* sp., *Trichophyton gypseum* [*T. mentagrophytes*] and *Geotrichum candidum* were found

less frequently. Many saprophytic species were also found. Daily disinfection of the washrooms effected a reduction of infection among the workers.

2206. WARREN (CLARA M.). **Tinea capitis in East London and Essex, 1944-1955.**—*Brit. J. Derm.*, 68, 7, pp. 264-267, 1956.

This is a review of all cases of tinea treated over a twelve-year period at the London Skin Department, a clinic which deals with approximately 6,000 new patients each year.

For tinea capitis the figures were *Microsporum audouini* (122 cases), *M. canis* (225), *Trichophyton sulphureum* (15), *T. discoides* (7), *T. mentagrophytes* (3), *T. quinckeanum* (2), and *T. equinum* (1). For tinea circinata [tinea corporis] they were *Microsporum audouini* (1), *M. canis* (40), *Trichophyton gypseum* [*T. mentagrophytes*] (2), and *T. discoides* (1).

An epidemic of *M. audouini* at several children's homes in Essex in 1945 is briefly described.

2207. DA FONSECA (A.). **Estudo epidemiológico da tinha do couro cabeludo no Norte da Portugal. Inquérito e factores epidemiológicos.** [Epidemiological study of tinea capitis in the north of Portugal. Inquiry and epidemiological factors.]—Reprinted from *Médico*, 1954, 165-168, 82 pp., 3 diag., 14 maps, 1954.

This important, fully tabulated and detailed survey of the distribution and epidemiology of tinea capitis in 11 municipalities of northern Portugal [2, Nos. 1661-1664 and next entry] revealed the presence of the complaint in 2,274 of the 58,775 schoolchildren examined—996 out of 30,678 boys and 1,308 out of 28,097 girls. The percentage of affected children in each municipality ranged from 0.4 to 12.6. *Trichophyton violaceum* was the predominant species, followed by *T. acuminatum* [*T. sabouraudi*], while *T. crateriforme* [*T. tonsurans*], *T. glabrum*, *T. granulosum*, and *T. roseum* were also encountered in smaller proportions. Microsporiasis was caused exclusively by *Microsporum felineum* [*M. canis*] and favus by *Achorion* [*T.*] *schoenleini*. There were 20 cases of mixed infection, comprising two each of *T. violaceum* and *T. sabouraudi* and *T. sabouraudi* and *T. schoenleini*, six of *T. violaceum* and *M. canis*, five of *T. sabouraudi* and *M. canis*, four of *T. violaceum* and *T. schoenleini*, and one of *T. violaceum* and *T. rubrum*.

2208. DA FONSECA (A.) & SILVA (M. S.). **A tinha do couro cabeludo no concelho de Viana do Castelo. Estudo epidemiológico e tratamento. Sugestões para aumentar a eficiência da luta contra a tinha.** [Tinea capitis in the municipality of Viana do Castelo. Epidemiological study and treatment. Suggestions for enhancing the efficiency of tinea control.]—Reprinted from *Médico*, 1955, 201-202, 31 pp., 1 fig., 3 maps, 1955.

This is a detailed survey of the incidence of tinea capitis among schoolchildren in one of the regions of northern Portugal [see preceding entry] visited from May, 1954, to February, 1955, by a 'mobile prophylactic' brigade [cf. 2, No. 1663]. Of the 4,316 boys and 4,003 girls examined, 238 (3.3 per cent.) and 317 (5), respectively, were infected, while 155 cases also occurred among 650 subjects of pre- and post-school age. The identity and relative prevalence of the dermatophytes involved have already been indicated.

The efficiency of the 'brigade' could be improved by its division into two groups, one concerned with inspection and the other with therapy by X-ray epilation, using a portable apparatus. The former should comprise a doctor, a secretary, and at least four welfare-workers to give essential instruction in hygiene, and the latter a doctor, a secretary, and a nurse. The organization of three or four such 'brigades' should ultimately lead to the disappearance of the disease, or at least to its reduction within tolerable limits.